ROORKEE

HYDRAULIC EXPERIMENTS.

BY

CAPT. ALLAN CUNNINGHAM, R.E.,

[illegible]

VOL. II.—TABLES.

PART I. DETAILED TABLES.

PART II. ABSTRACT TABLES.

ROORKEE:

PRINTED AND PUBLISHED AT THE THOMASON COLLEGE PRESS.

1880.

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Experiment Staff

Superintendent, — — — Capt. Allan Cunningham, R.E.

Senior Observer, — — — { Dec. 74—Aug. 77, Sergt. J. Warburton, R.A.
Sept. 77—April 79, Sergt. W. Porter, R.E.

Senior Computer and Clerk, May 78—Nov. 80, Sergt. W. Porter, R.E.

[For Detail of Observer and Computer Staff, see Text, Chap. II.]

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THOMASON COLLEGE PRESS.

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Sept. '77—April '79, Sergt. W Porters, R E.

Senior Computer and Checker, May '79—Novr '80, Sergt. W. Porters, R.E.

[For detail of Observer and Computer Staff, see Text, Chap II.]

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(iii) *Queried Results*—Results, such as Ranges, Means, Ratios, &c, depending on details of which some are either "doubtful" or "missing" (marked by a query as above) are themselves marked with a query, (indicating uncertainty). Again, Ranges and Means in any Sub Column containing fewer entries than the rest of the Series are (though correctly computed from their own data) also queried, to indicate that they are *not perfectly comparable* with the rest of the Ranges and Means of the Series.

(iv). *Edge-velocity*—Where required for insertion in Discharge-formulæ this quantity has been assumed zero: where space admitted in the Sub Column of Edge-velocity this is distinctly stated: where the space was very contracted, the entry ?0 has been made; this should be read as 'assumed zero in computing Discharge".

5. Leaders (.. ..)—These have been used both to fill up gaps in the Tables, and also to guide the eye across the page

These leaders (..)—when used to fill up gaps in the Tables—may be read to mean that "no figured entry is necessary in the space in question', (*see* Example in para 4—(ii))

6. Repeated Entries.—As a Rule all data required for each complete SET of Results were *independently obtained* But it often happened that several SETS of velocity-work were done in one day, whilst other data required for use with them were obtained only once or twice in the day, these last data have thus had to be *used more than once* to make the entries in each line or SET complete

To prevent such "repeated data' appearing to be independent observations, the entries are *repeated* by commas (,,), whenever they occur (as is usual) in successive lines

[In a few cases only, the lines in question do not run in succession in this case the "repeated data have been printed in full in each line; this could not well be avoided. As a general Rule all data not repeated by commas may be looked on as *independent*]

7 Repetitions—To save the eye in reading the Tables, much repetition of figures has been avoided in certain columns by omitting the repeated figures, leaving them to be supplied by the reader, as follows —

Dates The day, month, and year where repeated are *replaced* severally by commas (,,).

Gauge Readings, and *Depths* (Central (H), Actual (H) at Gauge (h) Hydraulic Mean (R)). The leading integers when repeated are *omitted*, the decimal portion only being printed.

Surface-breadths (b) and *Wet Borders* (B). The leading integers when repeated are *omitted*, the decimal portion only being printed.

Surface-Slopes (S). The printed Slopes all contain only three figures three decimals (·000) are in every case to be prefixed by the reader, *e.g.*, the printed 230 is to be read as ·000230

9. **Abbreviation-Symbols**.—Some symbols or single letters have also been used by way of abbreviation or with special meanings,—not as algebraic symbols

SYMBOL	MEANING
δ, Δ	Range, Discrepancy
C, T, W	Copper, Wood, Tin
e, t, q, m	Edge, Top immersed Step, Quarter point, Middle of Side-space.
L, R	Left, Right.
+, −	Water rose or fell, (in Column of "Variation").
+, −	*Used with special meanings in certain Tables, as therein explained*
< >	[*Detailed Tables* LXXV.-LXXVIII, *Abstract Tables* 26—31].
N, E, S, W	Direction of Wind *referred to current-axis as N S-Line*
V	Variable, (in Wind-direction column)
l, b, h, g	Light, Breeze, High Gusts (in Wind velocity column)
+	Used in Abstract Table 11 simply as a *separation* between formulæ

10. **Type**.—Different kinds of type are employed for sake of distinctness usually (but with occasional modification) as follows —

Numbering of Detailed Tables, Black letter Roman numerals, I —LXXXVI.
" " Abstract Tables, Black letter Arabic numerals, 1—34
" " Series, Black letter Arabic numerals, 1—262.

All the rest in Arabic numerals generally as follows —
Number of Sets in old brevier, *e g*, 13
Detailed Depths, and Detailed Velocities, in old face, *e g*, 9 87, 3 65
Differences, Ranges, and Discrepancies, in old brevier, *e g*, 07, 1 11
Data of Canal Control, in old brevier, *e g*, 10, 173 67.
All other Quantities usually in brevier, *e g*, 15-4 '78, 9 35, 110 3, &c.
References to Tables, Series, &c, usually in same type as original

11. **Preparation of Tables**.—The Tables have been prepared with great care the system of checking used in the original preparation of the MS is explained in the Text. In passing through the Press every *Proof* has been read with the MS by one of the Computer Staff, (as well as by the usual Press Readers) All corrections were verified in the "Revised Proofs" by the Press Readers, by one of the Computer Staff, and by the Superintendent himself.

12. **Errata**.—With every care, it has, however, been impossible to avoid mistakes altogether A good many Errata* were discovered whilst the Work was passing through the Press. Some of the worst of these have been corrected in a hand-proof† so as to save trouble to the reader; these therefore no longer appear as Errata. A List of all the rest as far as known‡ is published below The reader is requested to correct these with the pen

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ERRATA

Detailed Tables

Page	Table	Column	Sub-Column	Series	Line(s) of Series reckoned from: Top	Line(s) of Series reckoned from: Foot	Erratum	Correction
70	XV	3	F_1	19	..	3	6 32	6 39
69	XXIX	7	D	52	..	last	3.7 7	3.6 7
71	XXX	7	D	53	9	..	483 3	349 3
68	XXXIV	3	F_2	102	top	..	5.5	5 5
"	"	4	F_1	102	..	5	? ?	? 10
71	XXXV	7	D	[illegible]		3	2 153	2,131
73	XXXVI	8	V	[illegible]			4 21	4 39
"	"		V	[illegible]			3 81	3 86
74	XXXVII	3	F_2	[illegible]			4 87	? 4 87
"	"	4	From	"			sW 6	sW 4
"	"			"			NNW 1	N & W 1
"				"			3 17	? 3 17
78				11[illegible]			" "	"
60				19				69
"								
88	"			"				
91				1[illegible]				
16	"			1				
93	X			"				
106			V					
108			S					
			To					
			From					
			Both				.. 0	
			"				[illegible] .. [illegible]	
			V					
			D					
			V					
						last		
						last		35
						2		012
						2		1-03
						2		? 013
								67
								44
								28-3

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59	XXIX	7	D	52	..	last	327 7	326 7
61	XXX	7	D	53	9	..	483 3	348 3
68	XXXIV	3	F_2	102	top	..	555	5 55
"	"	4	To	102	..	5	? ?	? ?0
71	XXXV	7	D	107	..	3	2,152	2,151
73	XXXVI	8	V	108	9	..	4 21	4 30
"	"	"	V	109	..	9	3 83	3 86
74	XXXVII	3	F_2	111	..	last	4 87	? 4 87
"	"	4	From	"	9	.	SW 6	SW 4
"	"	"	Both	"	..	last	NNW 1	N b W 1
"	"	6	$41\frac{1}{2}$L	"	..	last	3 17	? 3 17
78	XXXIX	3	S	118	3	..	224	"
80	AL	2	Varn	127	1	..	0	00
"	"	3	S	"	..	8	195	"
88	XLIV	4	Both	160	..	last	W 4	W b S 4
91	XLV	8	V	165	4	..	4 60	2 46
96	XLVIII	2	R	179	..	2	·10	·15
99	XLIX	8	V	191	top	..	4 19	4 16
106	LIII	3	S	216	top	..	168	158
108	LIV	4	To	223	..	7	NW 11	NW 9
"	"	"	From	"	..	6	NW 8	NW 11
112	LVI	4	Both	231	..	2	.. 0	.. 0
"	"	"	"	232	..	2	.. 0	.. 0
120	LX	3	V	113 / 115	..	2	16	26
122	LXI	3	D	124	1	..	722 1	722 2
"	"	"	"	127	1	..	35 5	35 6
123	LXI	3	V	131	..	last	74	1 24
"	"	3	D	"	..	last	482·0	481 9
"	"	4	C	"	..	last	883	838
124	LXII	4	R	151	..	last	? 935	? 9 35
126	LXIII	4	C	160	..	2	? 12	? 012
129	LXIV	5	w	176	..	2	? 03	? 1 03
130	LXV	4	C	193	..	2	? 19	? 019

Abstract Tables

14	9	6	0	4	2	..	..	·07
"	"	"	0	12	2	..	30	44
45	31	2	Date	..	..	16	8-2	28-2

N B—Certain Misprints in Series Nos. 3, 5, 6, 7, 15R, 16R of the 1874 5 Report have been corrected on transfer to this Work. Details of the Misprints in the Old Work are not required, as it is superseded by this Work.

PART I.

DETAILED TABLES.

TABLES I.—LXXXVI.

PART I.—DETAILED TABLES.

Tables I.—LXXXVI.

These Tables contain the *details* of the whole of the experimental data and also such Results as depend directly on them

Abstract of Contents.

A detailed Table of Contents follows.

DETAILED TABLES,—CONTENTS.

TABLES I.—IV.

Average Cross-Sections at the Experimental Sites.

15th Mile Site,	...	...	...	...	Table	I.
Solání Embankment Main Site,	...	...			„	„
Belra Site,	...	...	...	...	„	II.
Jaolí Site,	...	...	...	...	„	III.
Kamhera Site,	...	...	...	...	„	IV.

Each Average Cross Section is the mean of eight Cross-Sections obtained by sounding at eight places along each Float-Course or line of Pendants in the manner explained in the Text, (see Art "Average Cross-Sections," *et seq*.)

Col. 3.—The figures in "old face type" (3·02) show the Average Height of the Bed above a certain Datum, obtained from eight soundings along a Float-Course.

Col 3.—The figures in "old brevier type" (1·7) show the "Range" of the eight soundings, *i. e.*, the difference between the greatest and least depth along a Float-Course, and thus affords a measure of the roughness of the Bed.

Foot of Table.—The figures in italic type (*1·04*) show the variation of the Bed along a Float-Course during the whole Season, *i. e.*, the difference between the greatest and least Average Heights in that Float-Course.

TABLES V., VI.

Hydraulic Elements at the principal Sites.

[*Argument*.—Height of Water Level above Datum = *h*].

[Central Depth = H, Surface-breadth = b, Wet Border = P, Area = A, Hyd. Mean Depth = R].

Solání Embankment Main Site,	...	Table V.
Solání Right Aqueduct Site,...	...	Table VI.

AVERAGE

[*Instrument*—

15TH MILE

Site.	1 Date, 1878-79	2 Water Level. Above Datum. A	Variation.	Central Depth H	3 Average Heights. *N.B*—The Datum is 30′ Each Average Cross-Section is a The "Range" is the difference between greatest. Left of centre. 85	82½	80	75	70	65	60	40	20	Centre.
OLD SITE	28-3-'78	13 91	+ ·01	9 5[illegible]	12 22	10 96	9 92	8 33	7·06	5·75	5 45	3 13	3 02	4 32
	Range*	..	..	..	9	1 0	7	1 4	1 7	·7	·1	·6	2 0	1 1
	31-5-'78	15 30	+ 03	11 31	11 92	11 07	9·95	8 44	7 29	5 94	5 46	3 37	4 24	3·99
	Range*	..	..	..	·6	7	1 4	1 6	·5	8	·3	1 4	2 7	2 1
Range of Average Heights,					·30	·11	·03	·11	·23	·19	·01	·24	1 22	·33
NEW SITE.	16-12-'78	15 29	− ·04	9 85	..	..	6 20	5·95	5 86	5·68	5 40	5 31	5 29	5 44
	Range*	..	..	..	..	..	6	·3	·5	4	5	8	1 5	1 0
	28 4-'79	15 33	+ ·02	10 30	..	..	6 70	6 03	5 92	5 85	5 78	5 43	5 28	4 97
	Range*	..	..	..	..	..	9	·4	3	6	·3	1 2	1 5	2 9
Range of Average Heights,					..	..	·50	·08	·06	·17	·38	·12	·01	·47

SOLÁNÍ EMBANK-

Site	Date, 1878-79.	Above Datum A	Variation.	Central Depth H	Average Heights of Bed. *N.B*—The Lower Datum is 3 below the. Left of centre.	75	73½	72½	70	65	60	40	20	Centre
449 S OF 17TH MILE.	15-8-'76	2 26	?	3·44	..	2 62	2 64	2 39	2 20	1 92	2 06	1 58	1 62	1 82
	Range*	..	..	..	..	51	?	?	46	45	·44	20	52	·90
	4-6-'78	10 04	·00	11 24	..	2 69	?	?	2·19	1 84	1 90	·76	1 ·9	1 80
	Range*	..	..	..	..	90			60	·60	1 20	1 50	1 20	·70
	28-3-'78	3·13	− ·04	3·57	..	3 28	3 31	3 10	3 05	3·00	2·84	2 41	2 43	2 56
	Range*	..	..	..	..	1 25	1 10	65	·25	·70	·70	62	45	·70
	13-11-'78	9·19	00	10·03	..	2 61	2 53	2 53	2 19	2 19	2 06	1·09	1 41	2 16
	Range*	..	..	..	..	1 00	·30	·60	30	·40	1 20	1 40	2 00	1 50
	16-12-'78	10·03	− 04	11·00	..	2·64	?	?	2 40	2 15	2 19	63	1 68	1·97
	Range*	..	..	..	..	·70			1 00	1 20	1 20	1 80	1 60	80
Range of Average Heights,					..	·67	? ·65	? 71	66	1 16	91	1 78	1·04	·76

CROSS-SECTIONS. TABLE I.

15′ *Sounding Rod*].

SITE.

OF BED ABOVE DATUM below 15th mile plinth. the Mean of eight Cross-Sections. and least soundings along a Float-Course									4				5
Right of centre.									Surface Breadth.	Wet Border	Area	Hyd Mean Depth	Reference to Plates
28	48	60	65	70	75	80	82½	85	b	B	A	R	
4 66 1 5	4 71 2 2	5 97 7	6·37 8	6 56 9	7 22 1 9	8 95 1·0	9 31 6	10 31 1 5	174 9	179 2	1484 4	8·29	Pl. II., Fig 1.
4 77 1 6	4 92 1 5	6·40 3	6·55 ·7	6·76 1 0	7 54 2 9	9·07 1 3	9 44 1 1	9 82 1 6	174 9	181 6	1706 5	9·40	..
·11	·21	·43	·18	·20	·32	·12	·13	·39	..	..	..	..	..
5 46 3	5 39 ·3	5 64 ·4	5 70 ·3	5 80 ·4	5 86 3	6·04 1·0	..	..	186·3	192 1	1687 1	8 78	Pl. II, Fig 1.
5 50 1 5	5 28 ·7	5 73 ·3	5 83 ·4	5 75 ·4	5 88 ·3	5 98 ·2	..	..	186·0	191 7	1700·0	8·87	..
·04	·11	·09	·13	·05	·02	·06	..	..	..	..	..	..	..

MENT MAIN SITE.

ABOVE LOWER DATUM. Upper Datum or original Bed level.									Surface-Breadth	Wet Border	Area.	Hyd M. Depth.	Reference to Plates.
Right of centre.													
20	40	60	65	70	72½	73½	75		b	B	A	R	
1 16 1 00	1·0 60	1 56 1 53	2·06 ·70	2 34 ·40	2 11 ?	2 24 ?	2 34 ·18	..	150·0	155·7	543·1	3·4	Pl. II., Fig 2
1 49 1 10	1 8 1 80	1 20 1·30	2 23 1 00	2 24 ·50	?	?	2 35 90	..	171·0	192 2	1809·3	9 41	..
2·03 ·95	2·0 ·50	2·0, 80	2 37 30	2 50 1 00	2·69 ·85	2 79 ·97	3·03 1 13	..	150·0	156·1	554·7	3·55	..
1·83 1 50	1·06 1 60	1 23 1 90	2 19 ·70	2 38 ·50	2 45 90	2 48 1 00	2·69 1 00	..	167·0	186·7	1623·9	8·7	Pl. II., Fig 2
1 24 1 00	·87 2 50	1 29 2 40	2·02 ·40	2 35 ·70	?	?	2 40 1 00	..	171·0	200·9	1799·2	8·96	..
·81	2·18	·87	·35	·26	1 ·53	1 ·55	·69	..	..	..	..	..	..

AVERAGE

[*Instrument*—

15TH MILE

Site.	1 Date, 1878 79	2 Water Level. Above Datum A	Variation.	Central Depth H	3 Average Heights. N.B—The Datum is 20' Each Average Cross-Section is * The "Range" is the difference between greatest. Left of centre. 85	82½	80	75	70	65	60	40	20	Centre.
OLD SITE	28 3 '78	13 91	+ ·01	9 59	12 22	10 96	9 92	8 33	7 06	5 75	5·45	3 13	3 02	4 32
	Range*	..	..	..	9	1 0	7	1 4	1 7	7	1	·6	2 0	1 1
	31 5-'78	15 30	+ 03	11 31	11 92	11 07	9 95	8 44	7 29	5 94	5 46	3 37	4 24	3 99
	Range*	..	..	..	6	·7	1 4	1 6	·5	8	·3	1 4	2 7	2 1
Range of Average Heights, .					*30*	*·11*	*03*	*12*	*23*	*·19*	*·01*	*24*	*1 22*	*33*
NEW SITE	16-12-'78	15 29	− 04	9 85	..	..	6 20	5·95	5 86	5 68	5 40	5 31	5 29	5 44
	Range*	..	..	..	..	..	6	3	5	4	5	8	1 5	1 0
	28 4 '79	15 33	+ 02	10 30	..	..	6 70	6·03	5 92	5 85	5 78	5 43	5 28	4 97
	Range*	..	..	..	..	..	9	·4	3	6	3	1 2	1 5	2 0
Range of Average Heights, .					..	,	*50*	*·08*	*·06*	*·17*	*38*	*12*	*01*	*47*

SOLÁNÍ EMBANK-

Site	Date, 1878 78.	Above Datum. A	Variation.	Central Depth H	Average Heights of Bed A H.—The Lower Datum is 3 below the Left of centre.	75	73½	72½	70	65	60	40	20	Centre
440 S OF 17TH MILE	15-8-'76	2 20	?	3·44	..	2 62	2 64	2 39	2 20	1 92	2 06	1 55	1 62	1 82
	Range*	..	..	..	..	51	?	?	46	45	44	20	52	90
	4 6-'78	10 04	00	11 24	..	2 69	?	?	2 19	1 84	1 90	·76	1 9	1 80
	Range*	..	..	..	..	90			60	60	1 20	1 50	1 20	70
	28-9-'78	3·13	− ·04	3·57	..	3 28	3 21	3 10	3 05	3·00	2 84	2 41	2 43	2 56
	Range*	..	..	..	..	1 25	1 10	65	25	·70	70	62	45	·70
	13-11 '78	9·19	00	10·03	..	2 61	2 53	2 53	2 19	2 19	2 06	1·09	1 41	2 16
	Range*	..	..	..	..	1 00	80	60	30	·40	1 20	1 40	2 00	1 50
	16-12-'78	10·03	− 04	11·00	..	2·64	?	?	2 40	2 15	2 19	63	1 68	1·97
	Range*	..	..	..	..	·70			1 00	1 20	1 20	1 80	1 60	80
Range of Average Heights, .					..	*·67*	*1 ·65*	*1 71*	*86*	*1 16*	*91*	*178*	*1·04*	*76*

CROSS-SECTIONS — TABLE I.

15′ *Sounding Rod*]

SITE

OF BED ABOVE DATUM below 15th mile plinth. the Mean of eight Cross Sections. and least soundings along a Float-Course — Right of centre									4 Surface-Breadth. b	4 Wet Border B	4 Area A	4 Hyd. Mean Depth R	5 Reference to Plates
20	40	60	65	70	75	80	82½	85					
4 66 1 5	4 71 2 2	5 97 7	6 37 8	6 56 9	7 22 1 9	8 95 1 0	9 31 6	10 31 1 5	174 9	179 2	1484 4	8 29	Pl II, Fig 1
4 77 1 6	4 92 1 5	6 40 3	6 55 7	6 76 1 0	7 54 2 9	9·07 1 3	9 44 1 1	9 82 1 6	174 9	181 6	1706 5	9 40	..
11	*21*	*43*	*18*	*20*	*32*	*·12*	*13*	*·49*		..	..	..	..
5 46 3	5 39 3	5 64 4	5 70 ·3	5 80 4	5 86 3	6·04 1·0	..	..	186 3	192 1	1687 1	8 78	Pl. II, Fig. 1.
5 50 1 5	5 28 7	5 73 3	5 83 ·4	5 75 4	5 88 3	5 98 2	..	..	186·0	191 7	1700·0	8·87	..
·04	*11*	*09*	*13*	*05*	*·02*	*·06*	..	..	..	..	..	.	..

MENT MAIN SITE

ABOVE LOWER DATUM. Upper Datum or original Bed-level. — Right of centre									Surface Breadth b	Wet Border B	Area A	Hyd. M Depth R	Reference to Plates.
20	40	60	65	70	73½	73¾	75						
1 26 1 00	1 05 60	1 36 1 53	2 06 70	2 34 40	2 11 ?	2 24 ?	2 34 18	..	150·0	155 7	543·1	3·49	Pl. II, Fig 2
1 49 1 10	1 85 1 80	1 20 1·30	2 73 1 00	2 24 50	?	?	2 35 90	..	171·0	132 2	1609·3	9 41	..
2·05 ·95	2·05 50	2·0, 80	2 37 30	2 50 1 00	2 69 85	2 79 97	3·03 1 13	..	150 0	156 1	554·7	3·55	..
1·83 1 50	1·06 1 60	1 23 1 90	2 19 70	2 38 ·80	2 45 90	2 48 1 00	2 69 1 00	..	167·5	160·7	1628·9	8·7.	Pl. II, Fig 2
1 34 1 00	·87 2 50	1 29 2 40	2·02 40	2 35 70	?	?	2 40 1 00	..	171·0	200·9	1799 2	8 96	..
81	*1·18*	*87*	*·35*	*26*	*1 58*	*1 55*	*·69*	..	..	..	..	..	..

AVERAGE

[*Instrument—*

BELRA

Site.	1 Date, 1879	2 Water Level: At Gauge. A	Variation	Central Depth H	3 Average Heights. The Datum is 4′. Each Average Cross-Section is. * The 'Range' is the difference between greatest. Left of centre.			90	80	70	60	40	20	Centre.
BELRA.	8-1-'79	7 52	·00	9 63	..	..	..	5 11	2 01	1 69	1 74	2 02	1 39	1 87
	Range*	..	..	..	..	..	..	2 4	2 0	1 1	1 3	1 4	1·0	1 2
	13-1-'79	6 71	− 40	8 90	..	..	..	4 75	1 86	2 01	1 81	1·88	1 67	1 81
	Range*	..	..	..	..	..	..	1 6	1 0	·9	1 1	1 4	1 1	1 1
	20-1-'79	7 05	00	9 71	..	..	..	4 92	1 97	1 82	1 77	1 91	1 90	1 34
	Range*	..	..	..	..	..	..	1 3	1 9	1 1	1 3	1 5	5	1 5
	29-1-'79	6·39	+ ·03	8 71	..	..	..	4 50	2 01	1·83	2 06	1 94	1 85	1 68
	Range*	..	..	..	..	..	..	4	1 7	1 0	1 2	1 0	1 2	1 8
	5-2 '79	6 28	·00	8 54	..	..	..	4 42	2 03	1 82	2·00	1·79	1 65	1 74
	Range*	..	..	..	..	..	..	·3	2 2	1 0	1 1	1 4	1 0	1 3
	12 2-'79	5 89	− 02	8 13	..	..	..	4 60	1 91	1 74	1 61	1 81	1·83	1 76
	Range*	—	..	..	..	..	..	1 0	2 0	7	1 2	·8	8	6
	19 2-'79	6 50	+ ·04	8 63	..	..	..	4 44	1 75	1·70	1 70	1 69	1 75	1 81
	Range*	..	..	..	..	..	..	1 1	1 8	·9	1·1	·9	1 3	1 0
	26 2-'79	6 63	− 03	8 86	..	..	..	4 58	1 78	1 60	1·72	1 68	1 75	1 77
	Range*	..	..	..	..	..	..	1 0	1 9	1 2	2	8	1 5	1 2
	5 3-'79	5 94	·00	8 23	..	..	..	4 41	1 66	1 61	1 95	1 76	1 76	1 71
	Range*	..	..	..	..	..	..	·6	1 7	·7	·5	·6	1·1	1 0
	12 3-'79	5 60	·00	7 83	..	..	..	4 42	1 74	1 64	1 72	1 77	1 77	1 77
	Range*	..	..	..	..	..	..	1 2	1 4	·6	6	7	·8	5
	19-3-'79	7 02	− ·04	9 21	..	..	..	4 28	1 73	1 59	1·82	1·66	1 69	1·81
	Range*	..	..	..	..	..	..	·7	2 1	7	9	1 1	1 2	4
	26-3-'79	7 23	− 03	9 58	..	..	..	4 64	1 68	1 69	1 45	1 57	1·83	1·65
	Range*	..	..	..	..	..	..	·9	1 8	6	1 0	9	1 1	9
Range of Average Heights, .					..	..	..	*83*	*·37*	*·42*	*61*	*·45*	*51*	*53*

CROSS-SECTIONS TABLE II.

15′ *Sounding Rod*]

SITE

OF BED ABOVE DATUM be ow Ga ge-Zero the Mean of e ght Cross Sections and least soundings along a Float-Course.									4				5
Right of centre									Surface-Breadth.	Wet Border	Area	Hyd Mean Depth	Reference to Plates
20	40	60	80	90					b	B	A	R	
1 39 2 0	1 24 1 6	1·04 1 1	1 16 8	1 81 2 1	5 51 3 8	..	..	..	188 5	196 3	1776·3	9·05	Pl IV, Fig 3
1 68 7	1 31 8	1 30 8	1 13 1 1	1 68 1 8	5 13 2 3	..	..	..	187 7	194 9	1626 4	8 35	
1 49 1 6	1 07 1 2	1 37 1 0	89 2 0	1 70 1 9	5 07 2 3	.	..	..	188·0	195 6	1715 5	8 77	
1 64 5	1 44 1 1	1 23 1 5	1 45 8	1 ,0 2 0	4 45 1 7	..	..	..	187 4	194 6	1564 3	8 04	
1 44 1 3	1 25 1 0	1 40 1 5	1 24 7	1 82 1 5	4 47 1 2	..	..	..	187 3	194 4	1555·0	8·00	
1 56 7	1 38 8	1 45 ·7	1·61 9	1 74 1 7	4 71 1 4	..	..	..	186 9	193 3	1475 3	7 6	
1 51 1 2	1 32 1 5	1 29 1 1	1 37 8	1 74 1 9	4 81 1 0	..	..	..	187 5	194 8	1599 4	8·21	
1 52 1 0	1 18 8	1 47 8	1 20 1 0	1 69 1 5	4 59 1 2	.	..	..	187·6	194·7	1631·3	8 38	
1 49 1 0	1 35 1 0	1 58 8	1·44 9	1 80 1 6	4·80 1 7	..	..	..	186 9	193 6	1491 2	7 70	
1 56 9	1 64 5	1 59 6	1 79 9	1 76 1 1	4 61 1 5	..	..	..	186 6	192 9	1414 7	7·38	Pl. IV., Fig 3
1 28 6	1 17 1 5	1 38 1 3	1 28 1 5	1 61 1 8	4 96 1 8	..	..	..	188·0	196·0	1703·7	8·70	
1 47 1 1	1 23 1 3	1 57 1 2	97 1 4	1 60 1 9	4 99 2 4	..	..	..	188·2	196·3	1752 2	8 93	
40	57	55	90	22	106	..	.	..	..	.	..	.	

AVERAGE

[*Instrument*—

JAOLI

Site.	1 Date 1879	2 Water Level: At Gauge A	Variation	Central Depth H		3 Average Heights. The Datum is 9' Each Average Cross Section is. * The "Range" is the difference between greatest. Left of centre: 92½	85	52½	75	67½	60	40	20	Centre
JAOLI	4 1-'79	7 04	+ 04	8 43	..	3 33	3 08	2 60	1 93	2 04	2 11	1 93	1 73	1 61
	Range*	..	..	..	..	6	10	9	10	7	8	9	11	7
	13 1-'79	6 53	− 26	7 04	..	3 21	3 06	2 67	1 71	2 01	1 95	1 6.	1 86	1 91
	Range*	..	.	..	..	5	7	15	10	8	9	9	8	6
	20 1-'79	6 80	− 02	8 2.	..	3 10	3 14	2 70	1 80	1 76	1 87	1 67	1 65	1 57
	Range*	..	..	..	..	6	5	15	9	6	5	8	8	7
	29 1 '79	5 86	− 04	7 1.	..	3 31	3 10	2 62	1 61	1 66	1 61	1 72	1 70	1 67
	Range*	..	..	..	..	·8	9	14	4	5	7	5	2	6
	5-2 '79	5 58	− 06	6 93	..	3 34	3 15	2 59	1 72	1 70	1 77	1 70	1 60	1 6.
	Range*	..	..	..	..	6	6	14	11	4	3	3	3	3
	12 2 '79	5 40	00	6 86	..	3 .0	3 16	2 56	1 60	1 56	1 57	1 65	1 59	1 54
	Range*	..	.	..	..	6	6	12	10	3	2	2	2	4
	19 2 '79	6 30	00	7 6.	.	3 34	3 21	2 49	1 69	1 70	1 67	1 64	1 65	1 65
	Range*	.	..	..	..	6	6	16	8	5	6	2	5	6
	26-2 '79	6 35	+ 02	7 7.	..	3 34	3 20	2 52	1 66	1 61	1 60	1 80	1 57	1 62
	Range*	..	..	..	..	5	5	15	10	7	7	5	2	7
	5-3 '79	5 63	00	7 0.	..	3 30	3 18	2 40	1 70	1 60	1 64	1 58	1 64	1 60
	Range*	..	..	..	..	·5	4	16	12	4	6	5	3	3
	12-3-'79	5 15	·00	6 00		3 27	3·07	2 42	1 57	1 52	1 51	1 54	1 50	1 49
	Range*	..	..	..	..	6	6	14	11	5	5	3	3	1
	19-3-'79	6·09	+ 02	8·04	..	3 33	3 10	2 51	1 80	1 70	1 69	1 65	1 69	1 65
	Range*	..	..	..	..	8	10	17	9	5	6	8	5	·7
	26-3-'79	7·0(	−·06	8·2.	..	3 31	3 0,	2 34	1 71	1 70	1 75	1 79	1 84	1 71
	Range*	..	..	..	..	9	9	16	11	6	6	7	7	9
Range of Average Heights,					.	*21*	*15*	*·06*	*36*	*52*	*60*	*39*	*36*	*32*

CROSS-SECTIONS

TABLE III

15′ *Sounding Rod*]

SITE

OF BED ABOVE DATUM below Gauge Zero, the Mean of eight Cross-Sections and least soundings along a Float-Course									4				5
Right of centre.									Surface Breadth	Wet Border	Area.	Hyd Mean Depth	Reference to Plates.
20	40	60	67½	75	82½	87½	92½		b	B	A	R	
1 75 1 3	1 51 8	1 16 1 1	1 40 5	1 76 3 2	3 06 2 3	3 53 1 3	4 34 1 6	.	192 6	199 8	1527 7	7 64	Pl V, Fig 3
1 89 7	1 62 9	1 20 6	1 22 4	1 67 2 8	3 01 2 7	3 67 1 8	4 39 1 4		192 1	198 8	1431 0	7 20	
1 72 3	1 52 6	1 32 6	1 24 4	1 79 2 8	2 97 2 5	3 65 1 8	4 40 1 5	..	192 4	199·5	1496·0	7 50	
1 61 5	1 43 7	1 21 7	1 18 8	1 73 2 8	2 87 3 2	3 57 1 6	4 36 1 5	..	191 4	197 3	1321 9	6 70	
1 48 7	1 44 4	1 08 6	1 15 6	1 64 3 6	3 14 2 2	3 75 1 0	4 37 1 8	..	191 1	196 6	1280 8	6 51	
1 45 3	1 34 3	1 10 5	1 09 6	1 60 2 6	2 91 2 7	3 54 1 9	4 30 1 7	..	191 0	196 1	1249·6	6 37	
1 41 4	1 31 6	1 17 6	1 05 5	1 50 2 2	2 92 2 8	3 56 1 8	4 34 1 6	..	191 9	198 2	1415·7	7 14	
1 45 6	1 35 9	1 17 7	1 09 8	1 72 2 9	2 86 2 9	3 66 1 6	4 29 1 4	..	191 9	198 2	1419 7	7 16	
1 50 2	1 43 4	1 17 5	1 07 6	1 53 2 7	2 87 2 5	3 59 1 7	4 29 1 4	..	191 2	196 8	1288 8	6 5.	
1 34 6	1 30 4	1 04 5	99 7	1 54 2 9	2 97 2 5	3 59 1 6	4 25 1 7	..	190 7	195 8	1213 4	6 20	Pl. V, Fig 3.
1 55 7	1 24 7	1 00 8	1 10 8	1 60 3 1	2 88 2 7	3 54 1 8	4 28 1 4		192 2	199 1	1491 3	7 4	
1 56 9	1 50 1 0	1 04 8	1 97 8	1 60 29	2 92 2 7	3 46 1 8	4 30 1 3	.	192·6	199 9	1537·9	7 70	
55	39	32	23	29	28	29	15				.		

AVERAGE

(*Instrument—*

KAMIENA

River	1	2				3								
	Date 1879	Water Level.				Average Heights of Dep								
		At Gauge	Variation	Central Depth		Each Average Cross-Section is								
						* The "Range" is the difference between greatest								
						Left of centre.								Centre.
		A		H		m	3 ½	25	22½	20	15	10	5	
KAMIENA	1-1-79	6·02	00	5·20	..	3·34	1·93	1·12	·97	·91	·74	·72	·89	·76
	Range*		..	.	.	19	13	5	9	4	13	11	6	12
	13-1-79	5·80	−·03	4·91		3·34	1·84	1·00	·92	·92	·79	·82	·86	·89
	Range*	.	..	.		21	16	3	5	4	6	4	6	5
	20-1-79	5·03	00	4·8[illegible]		3·25	1·[illegible]	·98	·95	·92	·93	·88	·79	·75
	Range*		..	.		16	13	5	7	6	9	6	6	8
	29-1-79	6·1[illegible]	00	5·2[illegible]	..	3·29	1·83	·93	·88	·81	·71	·79	1·04	·92
	Range*	..	..	..	..	27	17	4	11	10	9	10	10	5
	5-2-79	6·41	00	5·34	..	3·21	1·[illegible]8	1·05	·99	·94	·93	·91	·96	·90
	Range*	.	..	..	.	24	17	3	8	7	10	20	4	5
	12-2-79	5·37	−·03	4·80	..	3·17	1·81	·99	·71	·84	·58	·84	·83	·71
	Range*		..	.		24	18	6	5	3	6	6	9	11
	19-2-79	5·3[illegible]	00	4·6[illegible]	..	·99	1·56	·81	·61	·64	·68	·81	·71	·60
	Range*			.		25	19	7	6	4	6	4	5	6
	26-2-79	5·07	− 10	5·18	.	3·09	1·72	·78	·71	·79	·63	·8	·84	·79
	Range*	..	.		..	26	17	3	10	9	11	4	4	5
	5-3-79	5·20	00	4·3[illegible]	..	2·81	1·82	·89	·70	·57	·6[illegible]	·56	·71	·75
	Range*	..	..	..	..	29	19	6	8	8	6	6	6	6
	12-3-79	5·3[illegible]	00	4·[illegible]	..	3·11	1·64	·93	·65	·70	·76	·65	·6[illegible]	·83
	Range*	..	..	.	..	23	20	7	11	11	3	7	10	3
	19-3-79	5·22	− 01	4·75	..	2·96	1·84	·88	·73	·66	·49	·63	·66	·47
	Range*	..	..	..	..	23	19	4	6	6	4	3	6	11
	2-4-79	5·01	-00	4·9[illegible]	..	3·02	1·[illegible]2	·76	·70	·68	·65	·60	·72	·61
	Range*	.	..	..	.	30	18	7	7	8	8	5	11	7
Range of Average Heights,					.	.52	.37	.06	.32	.33	.14	.06	.35	.45

TABLE IV

CROSS SECTIONS

11′ *Sounding Rod*]

SITE

ABOVE GAUGE ZERO the Mean of e ght Cross-Sections and least soundings along a Fl at-Course.									4				5
R ght of centre									Surface-Breadth	Wet Border	Area	Hyd Mean Depth	Reference to Plates.
5	10	15	20	22½	25	27½	m		b	B	A	R	
92 11	81 11	97 5	92 4	89 7	98 8	1 73 1 5	3 53 1 3	.. ..	65 0	68 4	305 2	4 46	
92 6	94 5	81 5	91 4	94 5	91 2	1 89 8	3 94 1 5	. ..	64 6	67 8	288 8	4 26	
73 5	79 1 2	75 8	78 5	80 5	89 4	1 85 9	3 74 1 1	.	64 3	67 4	281 3	4 18	
81 8	64 1 1	46 1 0	8 7	82 9	84 6	1 71 7	3 94 4	.. .	65 3	68 8	313 6	4 55	
88 8	75 5	69 4	69 1 0	65 6	81 8	1 64 7	3 69 1 2	.. ..	65 4	69 4	334 5	4 81	Pl. VI., F g 3.
84 8	59 8	49 5	72 4	69 4	78 3	1 58 1 2	3 51 1 2	.. ..	64 2	67 4	282 4	4 1	
61 7	73 4	49 8	64 3	63 3	64 4	1 45 1 0	3 58 1 0	.. ..	64 1	67 3	277 5	4 12	
62 1 0	62 7	6 9	67 7	74 6	72 4	1 47 7	3 93 1 5	.. ..	65 2	68 8	310 9	4 5[illegible]	
62 4	74 6	77 5	60 5	55 5	61 4	1 45 1 4	3 52 1 5	. ..	64 0	67 1	270 8	4 04	
58 5	65 6	49 1 2	63 5	48 3	55 4	1 40 1 1	3 75 1 8	..	64 2	67 3	276 5	4 11	
62 6	59 3	63 4	53 6	52 5	67 5	1 36 6	3 57 8	.. ..	63 9	66 9	268 5	4 0[illegible]	Pl. VI., Fig 3.
75 8	46 9	57 8	56 8	55 6	61 5	1 38 8	3 71 1 2	.. ..	64 5	67 9	291 3	4 2[illegible]	
34	35	48	39	46	43	53	43						

HYDRAULIC ELEMENTS — TABLE V

SOLANI EMBANKMENT MAIN SITE — PERIOD, SEPT 1876 TO 24TH AUG 1878

For Reference, see next page

A	H	δ	B	A	R	Trend Bank	A	H	δ	B	A	R	Trend Bank
35	1 53	1·00	151 8	256 6	1 69								
1 84	3·02	·0	154 8	480 1	3 10								
85	03	0	8	481 6	11								
99	17	0	155 1	502 6	24								
2 00	18	0	1	504 1	25								
30	48	·0	7	549 1	53								
33	51	·0	8	553 6	55								
40	58	0	9	564 1	61								
47	65	0	156 1	574 6	68								
49	67	·0	1	577 6	70								
55	73	0	2	586 6	75								
87	4 05	0	9	634 6	4 05								
90	08	0	9	639 1	01								
91	09	0	157 0	640 6	08								
92	10	·0	·0	642 1	09								
3 04	22	0	2	660·1	20								
40	58	0	9	714 1	52								
50	68	0	158 1	729 1	61								
60	78	0	3	744 1	70								
70	88	0	5	759 1	79								
80	98	0	7	774 1	88								
85	5·03	0	8	781 6	9	12th, R							
86	·04	1·01 2	160 0	783 2	89								
90	08		1	789 7	93								
4 00	18	2	3	804 3	5·02	12th, L							
01	19	152 3	161 5	805 8	4 99								
10	28	3	7	819 6	5 07								
20	·38	3	9	834 8	16								
30	48	3	162 1	850 0	24								
40	58	3	3	865·3	33								
50	68	3	5	880 5	42								
59	77	3	7	894 2	50	11th, R							
60	78	153 5	163 8	895 7	47								
70	88	5	164·0	911 1	55								
73	91	5	1	915 7	58	11th, L							
74	92	1·04 7	165 3	917 2	55								
80	98	7	4	926 5	60								
90	6 08	7	6	94 0	69								
5 00	18	4	8	957 5	78		9						
10	28	7	166 0	9 2 5	·86								
20	38	7	2	988 4	95								
30	48	7	4	1003 9	6·04								
35	53	4	5	1011 6	·08	10th, R							
36	54	1·05 8	167 7	1013 1	01								
40	58	8	8	1019 4	·08								
44	63	8	9	1025 3	14	10th, L							
45	66	157 0	169 1	1031 9	10								
50	68	·0	1	1035 0	12								
60	78	0	3	1050 7	20								
70	88	·0	5	1066 4	29								
80	98	·0	7	1082 1	·37								
90	7·08	·0	9	1097 8	46								
6·00	18	0	170·1	1113 5	54								
·0	23	·0	3	1124 5	60	9th, R							
05	30	1·08·2	171·5	1129·1	57								
10	34		5	1135 2	53		10 00	18	0	1	1 69 5	21	
20	35	2	4	1146·0	67	9th, L	05	23	·0	2	1778·0	25	
21	37	1·09·3	172 9	1146·6	6·2								

TABLE V, (*continued*)

For Cross-Section, see Plate II Fig 2

The Treads of the 12 steps on each bank are numbered from the top (No. 1) downwards to the lowest (No 12)

Argument—h — Height above Datum.

H = Central Depth b = Surface-Broad B = Wet Bord r A = Area R = Hydraulic Mean Depth

Solani Embankment Main Site Period, 24th Aug '78 to April '79

h	H	b	B	A	R	Remarks: Depth below Tread of 12th Step on left bank	Date
1 64	2 27	150·0	153 2	342·5	2 24	2·36 below 12th	18- 9 '78
69	32	0	3	3·0 0	28	2 31 „ „	19 „ „
2 82	3·26	0	155 4	508 3	3 27	1 18 „ „	24- „ „
83	27	·0	·5	509·8	28	1 17 „ „	26- „ „
3 44	88	0	156 7	601 3	84	50 „ „	4 10 „
47	91	0	7	60o·8	86	·53 „ „	3 „ „
49	93	0	8	608 8	88	51 „ „	8 „ „

h	H	b	B	A	R	Remarks: Height above Tread of Step on left bank.	Date
8 29	9 32	164 0	181 7	1503 3	8 30	·7 above 7th	2- 4-'79
82	66	166 3	184 8	1567 6	48	35 „ 6th	28 10-'78
9 08	10 11	167 5	186 8	1638 7	77	61 „ „	7 12- „
43	46	168 7	188 7	1698 5	9 00	23 „ 5th	15- 4 '79
57	41	7	7	1694 2	8 98	37 „ „	18-11-'78
58	42	7	7	1695 9	99	·38 „ „	18- „ „
60	44	7	7	1699·3	9 00	40 „ „	19- „ „
88	91	169 8	190·7	1774 5	·30	68 „ „	20-12- „
91	94	8	8	1779 6	·33	71 „ „	19- „ „
93	96	8	·8	1783·0	·34	73 „ „	19- „ „
95	98	8	9	1786 4	·36	75 „ „	18- „ „
10·04	11 07	171·0	192 2	1800·9	·37	·08 „ 4th	14- „ „

TABLE VI

HYDRAULIC ELEMENTS

Solani Right Aqueduct

For Cross-Section, see Plate II., Fig 4 and (on large scale Plate I. Fig 3.

Argument — h = Depth at Gauge.

H = Central Depth, b = Surface-breadth, B = Wet Border A = Area, R = Hydraulic Mean Depth.

h = H	b	B	A	R	Remarks.	h = H	b	B	A	R	Remarks.
70	84·34	8ɔ 04	58 72	69		6 60	85 00	96 9ɔ	5ɔ9 93	5 78	
1 92	8ɔ·00	87 59	162 13	1 85		70	00	97 15	568 43	8ɔ	
2 00	,	75	168 93	93	{Top of curve.	80	00	3ɔ	576 93	93	
02	,	79	170 63	9ɔ		90	00	55	58ɔ 43	6·00	
60	,	88 9ɔ	219 93	2 47		7 00	00	7ɔ	593 93	08	
66		89 07	22ɔ 03	53		10	00	9ɔ	602 43	15	
71	,	17	229 28	57		20	00	98 1ɔ	610 93	22	
88	„	51	243 73	72		29	·00	·33	618 ɔ8	29	Offset.
3 00	,	7ɔ	2ɔ3 93	83		30	84 ɔ0	·8ɔ	619 43	27	
13	„	90 01	264 98	94		40	ɔ0	99 0ɔ	627 88	34	
18	,	11	269 93	99		50	49	2ɔ	636 33	41	
58	„	91	303 23	3 33		60	48	4ɔ	644 78	48	
60	,	9ɔ	304 93	35		70	46	6ɔ	6ɔ3 23	·56	
95	„	91 6ɔ	334 68	6ɔ		80	44	8ɔ	661 67	63	
99	„	73	338 08	68		90	41	100·0ɔ	670 11	70	
4 00	„	75	338 93	69		8 00	38	2ɔ	678 5ɔ	77	
10	„	9ɔ	347 43	78		10	34	4ɔ	686 99	84	
20	„	92 15	35ɔ 93	86		20	30	6ɔ	69ɔ·4°	91	
30	„	3ɔ	364·43	9ɔ		30	24	87	703 8ɔ	98	
40	„	5ɔ	372 ɔ3	4 03		40	18	101 09	712 27	7·0ɔ	
50	„	7ɔ	381 43	11		50	12	31	720 68	11	
60	„	9ɔ	389 93	20		60	04	53	729 09	18	
70	„	93 15	398 43	28		70	83 96	75	737·49	2ɔ	
80	,	3ɔ	406 93	36		80	86	99	745 88	31	
90	,	55	415 13	44		90	74	102 °5	754 26	·38	
5 00	„	75	423 93	52		9 00	61	·52	762 63	44	
10	„	95	432 43	·60		10	4ɔ	·81	770·98	50	
20	„	94 15	440·93	·68		20	2ɔ	103·13	779 3°	56	
30	„	3ɔ	449 43	76		30	8° 97	·53	787 63	61	
·40	„	55	4ɔ7 93	84		37	48	104 12	793 43	62	{Quadrant Head
50	„	7ɔ	466 43	92		·40	48	18	79ɔ·90	64	
60	„	9ɔ	474 93	5·00		50	48	·38	804 1ɔ	70	
70	,	9ɔ·15	483·43	·0ɔ		60	·48	58	812 40	77	
80	„	·3ɔ	491 93	16		70	48	78	820·6ɔ	83	
90	„	55	500·43	24		80	48	98	828 90	90	
6 00	„	7ɔ	508·93	32		84	48	10ɔ·06	83° 20	9°	
10	„	9ɔ	517 43	·3ɔ		85	·00	·06	833·0°	89	Offset
20	„	96 1ɔ	52ɔ·93	47		90	·00	06	837 12	92	
·30	„	·3ɔ	534 43	5ɔ		10 00	·00	·86	845·3°	99	
40	„	·ɔ5	542 93	·6°		10	·00	106·06	8ɔ3·ɔ2	8·0ɔ	
50	„	7ɔ	5ɔ1·43	°0							

TABLES VII.—XXVIII

Subsurface and Mean Velocities past a Vertical

Central Vertical.

Solání Left Aqueduct Site, ...	Series 1 to 4,	Tables VII, VIII
Solání Right Aqueduct Site, ...	Series 5 to 17,	„ IX. to XIV.
Solání Right Aqueduct Site, with Left Aqueduct closed, ..	Series 18 to 20,	„ XV.
Solání Embankment Main Site,	Series 21 to 28,	„ XVI. to XIX.

Non-Central Verticals.

Solání Right Aqueduct Site,	Series 29 to 40,	Tables XX to XXV.
Solání Embankment Main Site,	Series 42 to 46,	„ XXVI, XXVII.
	Series 41,	„ XXVIII.

δ, "Range" of (*i.e.*, difference between the greatest and least of) the quantities in the column
v, Mean of the quantities in the column
v', Value obtained from the velocity parabola corresponding to the preceding quantity (v).
Δ, Discrepancy between the last two quantities

Explanation of the Columns

Col.	Symbol	Detail.
2	h	Average height of water-surface above datum
	H	Actual depth of water on the vertical of experiment.
	l	Variation of water level during the experiment.
		Length of Rod used for finding Rod velocity (u).
3	F_1	Fall of water-surface in upper part of the Reach.
	F_2	Fall of water-surface in middle part of the Reach
	F_3	Fall of water-surface in lower part of the Reach.
	S	Local Surface-Slope, (3 decimals, *i. e.*, 000, to be prefixed by reader).
4		*Direction (referred to the current-axis as N S. line), and Velocity (in feet per second)* of the Wind, at beginning and end of each SET
5		*Initials of the Timekeeper*
6	v_s	Velocities at surface ($z = 0$) and at every foot of depth ($z = 1$, 2, 3, &c.) below the surface, each entry being the mean of 3 observations at the nominal depths indicated by the length of the Connector (r).
	v_H	Bed velocity computed from the above.
7	D	Discharge past the vertical (in sq. ft. per sec.), computed from the velocity-data of Col. 6
8		*Three approximations to Mean Velocity past the vertical.*
	U	Quotient of Discharge ÷ Depth, *i. e.*, (D ÷ H), from Col. 7.
	$v_{\frac{1}{10}H}$	Mid-depth velocity computed from the data in Col. 6.
	u	Rod velocity, the mean of 6 trials.
9		Values of the differences $(v_{\frac{1}{10}H} - U)$ $(u - U)$ between the approx. mean velocities in Col. 8

SUBSURFACE AND MEAN VELO-

Solání Left Aqueduct—

[*Instruments—3″ Double-Floats,*

Serial No	1 Date, 1875.	2 Depth Actual. H	2 Depth Variation.	2 Length of Rod. l	3 Fall of Water-Surface. Upper 5 miles. F_1	3 Fall of Water-Surface. Lower 4½ miles. F_2	3 Fall of Water-Surface. Local Slope. S	4 Wind. From Direction.	4 Wind. From Velocity.	4 Wind. To Direction.	4 Wind. To Velocity.	5 Timekeeper's Initial	Subsurface past the cen (Each Velocity is the Nominal) 0	1	2	3
Series 1.	5-4-'75	9 50	·00	9	5 65	5 40	Not observed.	..	0	..	0	R	4 33	4 29	4 41	4·05
	6-4- „	50	00	9	„	„		W	7	SW	5	W	4 10	4 22	4 41	4 32
	„ „	50	·00	9	5 65	5 35		..	0	..	0	R	4 26	4 11	4·05	4 29
	„ „	50	00	9	„	„		..	0	..	0	W	4 32	4 17	4 29	4 14
	„ „	50	·00	9	„	„		..	0	..	0	R	4 36	4 17	4 29	4 11
	7-4- „	·50	00	9	5 65	5·35		..	0	..	0	W	4 28	4 26	4 11	4 11
	„ „	50	00	9	„	„		..	0	..	0	R	4 19	4 00	4 17	4·00
	„ „	·50	·00	9	„	„		..	0	..	0	W	4 19	4 41	4 32	4 32
	8-4- „	·50	00	9	5 65	5 35		..	0	SW	7	R	4 30	4 22	4 11	4 22
	„ „	·50	·00	9	„	„		SW	7	SW	30	W	4 18	4 20	4 44	4 44
	9-4- „	50	·00	9	5 65	5·35		..	0	..	0	R	4 23	4·11	4 41	4 35
	„ „	·50	·00	9	„	„		..	0	..	0	W	4 33	4 38	4·03	4 20
	10-4- „	50	00	9	5 60	5 35		..	0	..	0	R	4 32	4 17	4 11	4 22
	„ „	·50	00	9	„	„		..	0	..	0	W	4 3-	4 35	4 41	4 22
	12-4- „	·40	·00	9	5 70	5 20		..	0	..	0	R	4 08	4 41	4 11	4 29
	„ „	·40	·00	9	„	„		..	0	..	0	W	4 17	4 26	4 11	4 05
	14-4- „	40	00	9	5 75	5 20		..	0	..	0	R	4 18	4 17	3 95	4 29
	„ „	·40	00	9	„	„		..	0	W	4	W	4 29	4 32	4 20	4·03
	15-4- „	·25	·00	9	5 70	5·10		..	0	..	0	R	4 28	4 05	4 35	4 17
	„ „	·25	·00	9	„	„		..	0	..	0	W	4 25	4 44	4 17	4 44
δ	Range,	·25	..	0	·15	·30	..	..	..	..	..	..	·28	·44	·49	·44
v	Means of 30	9·46	..	9	5 67	5·30	..	SW & W 2				..	4 25	4 21	4 22	4 21
v′		Parabolic, (v′)											4 25	4 25	4 23	4 18
Δ		Discrepancies, (v − v′)											00	− 01	− ·01	+ ·03

Series 2, 3, see

Series 4.	18-2-'75	5·95	·00	5	5·85	2 53	Not observed	S	8	S	15	W	3 45	3 49	3 45	3 29
	„ „	93	− 05	5	5 87	2 53		S	15	S	10	R	3 45	3 49	3 45	3 49
	„ „	·90	·00	5	5·90	2·50		S	16	S	20	W	3 45	3 49	3 57	3 37
	„ „	·90	·00	5	„	„		S	15	S	15	R	3 52	3 70	3 66	3 40
δ	Range,	·05	..	0	03	03	..	..	..	..	..	..	·07	21	21	·20
v	Means of 4,	5·92	..	5	5·88	2 52	..	S 15				..	3·47	3 54	3·53	3·39
v′		Parabolic, (v′)											3 48	3 53	3·50	3 41
Δ		Discrepancies, (v − v′)											− 01	+ 01	+ 03	− ·02

CITIES PAST A VERTICAL — TABLE VII.

CENTRAL VERTICAL

and 1" wood Rods]

6								7	8			9	
VELOCITIES tral vertical mean of three observations) Depths (z)							Rod velocity	DISCHARGE past the vertical	MEAN VELOCITY past the vertical Various Approximations.			DIFFERENCES	
									Discharge / Depth	Mid-depth Velocity.	Rod Velocity Mean of 6 trials		
4	5	6	7	8	9	10	v_π	D	U	$v_{\frac{1}{2}\pi}$	u	$(v_{\frac{1}{2}\pi} - U)$	$(u - U)$
4·17	4·29	3·80	3·75	3·85	3·75	..	3·70	38·6	4·07	4·26	3·95	+ ·19	− ·12
4·20	3·97	3·95	3·59	3·45	3·39	..	3·56	37·3	3·95	4·03	3·74	+ ·08	− ·21
4·05	4·11	3·90	3·75	3·80	3·66	..	3·59	37·8	3·98	4·10	3·85	+ ·12	− ·13
4·14	3·97	4·03	3·73	3·49	3·66	..	3·75	37·7	3·97	4·01	3·75	+ ·04	− ·24
4·05	4·17	3·90	3·80	3·61	3·53	..	3·42	37·7	3·97	4·14	3·83	+ ·17	− ·14
4·03	3·80	3·95	3·77	3·73	3·35	..	3·13	37·2	3·91	3·86	3·81	− ·05	− ·10
4·00	4·05	3·95	4·11	3·66	3·61	..	3·58	37·7	3·97	4·04	3·92	+ ·07	− ·05
4·00	3·87	4·00	3·66	3·95	3·57	..	3·38	38·1	4·01	3·90	3·74	− ·11	− ·27
4·35	3·90	3·95	3·95	3·75	3·35	..	3·12	37	3·99	4·01	3·91	+ ·02	− ·09
4·32	4·05	4·00	3·75	3·90	3·51	..	3·31	38·7	4·07	4·12	3·40	+ ·05	− ·61
4·22	3·95	3·80	3·66	3·41	3·57	..	3·65	37·6	3·96	4·02	3·59	+ ·06	− ·37
4·00	4·03	4·14	3·87	3·73	3·64	..	3·59	38·1	4·01	4·02	3·77	+ ·01	− ·24
3·95	4·00	3·75	4·00	3·61	3·41	..	3·31	37·4	3·93	3·99	3·75	+ ·06	− ·20
4·29	4·17	3·90	3·80	3·66	3·75	..	3·80	38·6	4·07	4·20	3·68	+ ·13	− ·39
4·22	3·90	3·85	3·80	3·57	3·26	..	3·14	37·0	3·95	4·00	3·75	+ ·05	− ·20
4·17	3·97	4·05	3·80	3·61	3·64	..	3·65	37·4	3·98	4·03	3·70	+ ·05	− ·28
4·29	4·22	4·00	4·00	3·85	3·80	..	3·76	38	3·97	4·24	3·85	+ ·27	− ·10
3·90	3·97	3·90	3·83	3·68	3·59	..	3·5	37·2	3·96	3·95	3·83	− ·01	− ·13
4·17	3·90	3·95	4·05	3·49	3·66	..	3·70	37·6	4·00	4·00	3·85	·00	− ·15
4·20	3·83	3·95	3·85	3·64	3·66	..	3·67	37·3	4·04	3·97	3·81	− ·07	− ·1[illegible]
·45	·49	·44	·52	·54	·54	..	·68	1·7	1·6	·40	·55	·38	·62
4·14	4·01	3·92	3·83	3·67	3·57	..	3·51	37·8	3·99	4·04	3·77	+ ·05	− ·22
4·12	4·04	3·94	3·82	3·68	3·52	..	3·44	37·6	3·99	4·06	..	+ ·07	..
+ ·02	− ·03	− ·02	+ ·01	− ·01	+ ·05	..	+ ·07	0	·00	− ·02	..	− ·02	..

NEXT PAGE

3·16	3·22	..	..	..	..	.	3·18	19·3	3·34	3·29	3·40	− ·05	+ ·06
3·19	3·09	..	..	..	..	..	3·00	19·8	3·33	3·49	3·45	+ ·16	+ ·12
3·12	2·97	..	..	..	..	..	2·85	19·4	3·26	3·38	3·12	+ ·12	− ·14
3·09	3·09	..	..	..	..	..	3·09	20·0	3·36	3·41	3·29	+ ·05	− ·07
·17	·25	..	..	..	..	..	·35	·6	·10	·20	·33	·21	·20
3·10	3·09	..	..	..	..	..	3·04	19·[illegible]	3·32	3·39	3·32	+ ·07	·00
3·24	3·00	..	..	..	..	..	2·71	19·6	3·31	3·41	..	·10	..
− ·08	+ ·09	..	..	.	..	..	+ ·3	+ ·[illegible]	+ ·01	− ·02	..	− ·03	..

Serial No.	1 Date, 1875.	2 Depth. Actual. H	2 Depth. Variation.	2 Length of Rod. l	3 Fall of Water-Surface. Upper 5 miles F_1	3 Fall of Water-Surface. Lower 4½ miles F_2	3 Local Slope S	4 Wind. From. Direction.	4 Wind. From. Velocity	4 Wind. To. Direction	4 Wind. To. Velocity	5 Timekeeper's Initial	Subsurface past the con- [Each Velocity is the Nominal 0	1	2	3
Series 2	27-1-'75	9 00	·00	No Rods used	5 70	4 90	Not observed	*	0	*	0	W	4 17	4 22	4 29	4 22
	" "	00	·00		"	"		..	0	..	0	R	4 29	4 22	4 35	4 22
	" "	00	00		"	"		..	0	..	0	R	4 41	4 29	4 48	4 48
	" "	00	00		"	"		..	0	SW	12	W	4 17	4 48	4 35	4 55
	" "	00	·00		"	"		SW	12	?	?	W	4 17	4 48	4 29	4 17
	" "	·00	·00		"	"		?	?	SW	11	R	4 17	4 11	4 29	4 17
	28-1- "	8 96	00		5 70	4 85		..	0	?	?	W	4 29	4 29	4 35	4 29
	" "	95	00		"	"		?	?	NE	4	R	4 41	4 55	4 41	4 22
	" "	95	00		5·75	"		NE	4	?	?	W	4 69	4 55	4 41	4 17
	" "	95	00		"	"		?	?	NE	4	R	4 48	4 41	4 35	4 29
	" "	·95	·00		"	"		NE	4	?	?	W	4 48	4 29	4 29	4·35
	" "	95	00		"	"		?	?	SE	6	R	4 48	4 22	4 55	4 48
	" "	95	00		"	"		S	3	?	?	W	4 17	4 48	4 35	4 35
	" "	95	00		"	"		?	?	..	0	R	4 29	4 17	4 29	4 05
	29-1- "	95	00		5 70	4 85		..	0	?	?	W	4 35	4 48	4 48	4 35
	" "	95	00		"	"		?	?	E	10	R	4 48	4 11	4 35	4 35
	" "	95	00		"	"		E	10	?	?	W	4 29	4 35	4 41	4 35
	" "	95	00		"	"		?	?	..	0	R	4 55	4 29	4 11	4 41
	" "	95	00		"	"		..	0	?	?	W	4 35	4 48	4 29	4 23
	" "	95	00		"	"		?	?	NE	6	R	4 11	4 29	4 35	4 55
	" "	95	00		"	"		NE	6	?	?	W	4 35	4 48	4 29	4 35
	" "	95	00		"	"		?	?	..	0	R	4 29	4 11	4 35	4 22
δ	Range,	05	..	..	05	·05	..	..	..	..	..	..	58	44	·44	50
v	Means of v.	8 96	..	..	5·71	4 80	..	* SE δ E 1				..	4 34	4·33	4 35	4 31
v		Parabolic, (v)			..	..	..	..	..	..	..	..	4 33	4 35	4 35	4 31
Δ		Discrepancies, (v − v)			..	..	..	..	..	..	..	..	+ 01	− 02	00	00
Series 3.	19-2-'75	7 23	00	6	3 80	3·80	Not observed	..	0	..	0	W	3 85	3·95	4·00	3 80
	" "	23	00	6	"	"		..	0	S	8	R	3·90	3·80	3·95	3 61
	" "	23	·00	6	"	"		S	8	S	6	W	3 70	3 75	3 85	3 66
	" "	23	00	6	"	"		S	6	S	7	R	3·66	4 00	4·05	3·85
	" "	23	00	6	"	"		S	7	..	0	W	3 80	3 90	3 90	3 70
	" "	23	00	6	"	"		..	0	S	7	R	3 70	3·80	3 75	3·95
	20-2- "	23	·00	6	3 80	3·80		..	0	..	0	W	4 00	3 85	3 80	3 80
	" "	23	00	6	"	"		..	0	S	5	R	3 85	3 95	3 95	3 75
	" "	23	00	6	"	"		S	5	..	0	W	3 75	3·85	3·90	3 70
	" "	23	00	6	"	"		..	0	..	0	R	3·90	4·00	3 85	3 80
	" "	·23	·00	6	"	"		..	0	S	7	W	3 80	3 80	3 80	3 66
	" "	23	00	6	"	"		..	0	..	0	R	3 90	3·90	3·90	3 70
δ	Range,	00	..	0	00	05	..	..	..	..	..	..	·34	·25	30	34
v	Means of v.	7 23	..	6	3·83	3·83	..	S 3				..	3·82	3·88	3·89	3·7
v		Parabolic, (v)			..	..	..	..	..	..	..	..	3 84	3 56	3 84	3·77
Δ		Discrepancies, (v − v)			..	..	..	..	..	..	..	..	− 02	+ 02	+ 05	− 02

CITIES PAST A VERTICAL. TABLE VIII.

Central Vertical.

and 1" wood Rods].

6								7	8			9	
Velocities trai vertical. (mean of three observations).							Bed velocity.	Discharge past the vertical.	Mean Velocity past the vertical. Various Approximations			Differences	
Depths (z).									Discharge / Depth	Mid depth Velocity.	Rod Velocity Mean of 6 trials.		
4	5	6	7	8	9	10	v_R	D	U	$v_{\frac{1}{2}R}$	u	$(v_{\frac{1}{2}R} - U)$.	$(u - U)$.
4·17	4·11	4·05	3·90	3·75	..	..	3·60	36·6	4·07	4·14		+·07	..
4·11	4·11	4·05	4·05	3·95	..	..	3·85	37·1	4·12	4·11		−·01	..
4·41	3·95	4·11	3·85	3·66	..	..	3·47	36·5	4·06	4·18		+·12	..
4·23	4·11	4·05	3·70	3·66	..	..	3·62	37·0	3·99	4·16		+·17	..
4·22	4·05	3·90	3·85	3·61	..	..	3·37	36·9	4·10	4·13		+·03	..
4·35	3·90	3·90	3·77	3·70	..	..	3·63	37·2	4·13	4·12		−·01	..
4·05	4·22	4·17	3·80	3·61	..	..	3·43	36·5	4·08	4·13		+ 05	..
4·35	4·11	4·17	3·75	3·75	..	..	3·75	37·1	4·14	4·23		+·09	..
4·29	4·17	4·11	3·90	3·75	..	..	3·61	37·2	4·16	4·23		+ 07	..
4·29	4·17	4·00	3·90	3·80	..	..	3·70	37·1	4·15	4·23		+ 08	..
4·23	4·05	4·05	3·95	3·70	..	..	3·46	36·7	4·10	4·14		+ 04	..
4·35	4·35	4·17	3·85	3·66	..	..	3·48	37·4	4·17	4·35		+·18	..
4·22	4·35	4·11	3·90	3·66	..	..	3·43	37·2	4·16	4·28		+·12	..
4·22	4·25	4·17	3·85	3·61	..	..	3·38	36·2	4·04	4·23		+·19	..
4·29	4·17	4·05	3·85	3·75	..	..	3·65	37·2	4·16	4·23		+ 07	..
4·48	4·22	4·05	3·90	3·80	..	..	3·70	37·0	4·14	4·36		+·22	..
4·29	4·11	3·95	3·85	3·57	..	..	3·30	36·3	4·08	4·20		+ 12	..
4·29	4·17	3·95	3·75	3·66	..	..	3·57	36·6	4·09	4·23		+·14	..
4·11	4·29	4·17	4·05	3·75	..	..	3·46	37·2	4·16	4·20		+ 04	..
4·17	4·05	4·22	3·80	3·80	..	..	3·80	37·0	4·13	4·11		−·02	..
4·41	4·29	3·86	4·05	3·85	..	..	3·66	37·6	4·20	4·35		+·15	..
4·23	4·11	4·08	3·66	3·66	..	..	3·66	36·6	4·03	4·17		+·14	..
·43	·45	·37	·39	·38	..	..	·55	1·7	·21	·25	..	·24	..
4·26	4·15	4·06	3·86	3·71	..	..	3·57	36·9	4·11	4·21	..	+ ·10	..
4·25	4·16	4·04	3·89	3·71	..	..	3·52	36·8	4·11	4·21	..	+·10	..
+·01	− 01	+ 02	−·03	·00	..	..	+·05	+·1	·00	·00	..	·00	..
3·61	3·37	3·40	Not observed.	..	..	..	3·44	26·0	3·66	3·68	3·57	+·02	−·09
3·66	3·45	3·49		..	..	..	3·54	26·4	3·62	3·64	3·45	+·02	−·17
3·53	3·33	3·26		..	..	..	3·17	25·7	3·52	3·58	3·45	+·06	−·07
3·53	3·29	3·33		..	..	..	3·38	26·4	3·65	3·65	3·60	·00	+·01
3·61	3·40	3·19		..	..	..	2·9	25·8	3·56	3·64	3·6	+·08	+·07
3·53	3·61	3·33		..	..	..	2·98	26·1	3·65	3·61	3·70	−·04	+·05
3·57	3·66	3·45		..	..	..	3·19	26·7	3·68	3·66	3·50	−·02	−·18
3·57	3·37	3·37		..	..	..	3·3	26·4	3·64	3·64	3·6	·00	−·01
3·85	3·57	3·49		..	..	..	3·39	26·6	3·67	3·79	3·77	+·13	+·10
3·66	3·66	3·49		..	..	..	3·2	27·0	3·73	3·71	3·36	−·02	− 35
3·49	3·33	3·45		..	..	..	3·60	26·1	3·59	3·55	3·57	−·04	−·02
3·61	3·66	3·37		..	..	..	3·01	26·4	3·64	3·64	3·45	·00	− 11
·36	·37	·30	..	..	..	..	·67	1·3	·21	·24	·39	·16	·43
3·60	3·47	3·3	..	..	..	..	3·27	26·4	3·63	3·65	3·50	+·02	−·07
3·66	3·49	3·28	..	..	..	..	2·95	26·1	3·60	3·71	..	+·11	..
−·06	−·02	+ 10	..	..	..	..	+ 32	+·3	+·03	− 06	..	−·09	..

* What observed only at beginning and end of alternate lots in this Series.

SUBSURFACE AND MEAN VELO-

Solání Right Aqueduct—

[*Instruments*—1§" *Double-Floats,*

Serial No.	1 Date, 1876 77 78.	2 Depth. Actual.	2 Depth. Variation.	2 Length of Rod.	3 Fall of Water Surface. Upper 4 miles.	3 Fall of Water Surface. Lower 4¼ miles.	3 Local Slope.	4 Wind. From Direction.	4 Wind. From Velocity.	4 Wind. To Direction.	4 Wind. To Velocity.	5 Timekeeper's Initial.	Subsurface past the con (Each Velocity is the Nominal 0	1	2	3
		H		l	F_1	F_2	S									
Series 5.	18-8-'77	9 97	+ 02	9'	5 98	5-50	?	NE	3	SW	l	P	4 76	4 55	4 80	4 69
	" "	9	+ 02	9¼	5 96	5 52	?	SW	l	SW	l	W	4 69	4 65	4 72	4 76
	17-8- "	97	+ 03	9¼	5 98	5 50	?	W	4	ENE	5	P	4 88	4 48	4 76	4 76
	" "	9	00	9,	5 97	5 51	?	ENE	5	NNE	7	W	4 58	4 76	4 84	4 65
	17-6-'78	97	+·03	9¼	5 98	5 52	20	W	4	..	0	P	4 35	4 61	4 76	4 69
	19-6- "	96	00	9¼	5 99	5 51	19	N	9	..	0	R	4 20	4 76	4 65	4 69
	25-6- "	9	+ 02	9¼	6·00	5 45	20	S	l	W	8	R	4 69	4 61	4 76	4 76
	" "	97	+ 02	9	5 98	5 47	"	W	6	S	l	P	4 65	4 61	4 69	4 92
	1-7- "	96	·00	9	5 99	5 41	20	E	4	..	0	P	4 61	4 44	4 72	4 72
	" "	"	·00	9	"	"	"	..	0	E	13	R	4 05	4 84	4 61	4 72
	22-6- "	9	00	9	6·00	5 50	20	S	4	S	12	P	4 48	4 84	4 92	4 92
	27 6- "	9	+ 01	9	6 00	5 43	207	V	l	SSE	8	R	4 84	4 69	4 80	4 76
	4 7- "	9	00	9¼	6 03	5 35	20	NE	7	NE	12	P	4 08	4 72	4 85	4 92
	16-8 '77	87	− 01	9	5 90	5 40	?	NE	4	ENE	5	P	4 76	4 72	5 24	5·00
	" "	86	− 01	9¼	5 94	5 39	?	ENE	5	ENE	6	W	4 80	4 76	4 72	4 76
	15-8- "	77	− 06	9¼	5 93	5 37	?	NNE	8	..	0	W	4·80	4 72	4 69	4 58
d	Range,	·22	..	0	10	17	?	..	..	..	..	..	83	·40	49	·42
ϖ	Means of 16	9 94	..	9·5	5 98	5 45	?	NE δ E 2				..	4 58	4·67	4 70	4 77
ϖ'		Parabolic, (σ)			..	..	..	..	..	..	..	..	4 61	4·67	4 71	4 72
Δ		Discrepancies, (σ − υ)			..	..	..	..	..	−	..	..	− 03	00	+ ·04	+ 05
Series 6.	28-4-'77	9 48	00	9	5 82	5 28	17	..	0	N	8	P	4 20	4 55	4 44	4 51
	" "	·48	00	9	"	"	"	V	8	V	10	W	4 72	4 41	4 17	4 44
	30-4- "	·48	·00	9	5 82	5·28	?	N	6	N	7	P	4 11	4 48	4 29	4 32
	" "	·48	·00	9	"	"	?	N	8	N	l	W	4 48	4 35	4 75	4 59
	" "	·48	·00	9	"	"	?	S	5	V	2	P	3 95	4 22	4 51	4 44
	30-5-'76	4	·00	9	5 90	5 35	?	E	9	NE	10	W	4 61	4 38	4 55	4 26
	" "	45	00	9	"	"	?	NE	12	E	20	H	4 48	4 32	4 41	4 51
	3-6- "	44	+ ·02	9	5·91	5 31	?	SE	11	NE	10	W	4 35	4 55	4 38	4 32
	" "	44	·00	9	5 80	5 23	?	NE	8	E	1	H	4·00	4 41	4 38	4 17
	10-6- "	43	·00	9	5 82	5 23	?	..	0	..	6	W	4 26	4 35	4 35	4 41
	" "	43	00	9	"	"	?	..	0	NE	1	H	4 38	4 44	4 26	4 20
	3-7-'78	33	·00	8	5 97	5·04	198	V	l	V	4	R	4 00	4 38	4 41	4 35
	7-7- "	33	·00	9	5 87	5·06	186	..	0	S	4	R	3 85	4 20	4 35	4 56
	" "	30	− 03	9	5·88	5·03	"	S	5	..	6	P	4 20	4 32	4 48	4 44
	8-7- "	27	·00	8	5·83	5·02	186	..	0	S	5	R	4 22	4 17	4 32	4 41
	" "	27	·00	8¼	"	"	"	S	8	..	6	P	4 00	4 20	4 38	4 41
d	Range,	21	..	3	·10	·33	?	..	..	..	..	..	87	·33	33	·41
ϖ	Means of 12	9·41	..	8·5	5·81	5 23	?	NE δ E 4				..	4 23	4 36	4 38	4 40
ϖ'		Parabolic, (σ)			..	..	..	..	..	..	..	..	4 27	4·33	4·36	4 37

CITIES PAST A VERTICAL — TABLE IX

CENTRAL VERTICAL

and 1" tin Tube Rods]

6								7	8			9	
VELOCITIES tral vertical mean of three observations] Depths (z)							Ed velocity	DISCHARGE past the vertical	MEAN VELOCITY past the vert al Various Approxima ions.			DIFFERENCE.	
									Dischargo / Depth	Mid-depth Ve ocity	flod Velocity Mean of 6 trials		
4	5	6	7	8	9	10	v_H	D	U	$v_{\frac{1}{2}H}$	u	$(v_{\frac{1}{2}H} - U)$	$(u - U)$
4 65	4 65	4 69	4 35	4 55	4 41	4 48	4 48	4 0 (	4 57	4 65	4 36	+ 08	− 21
4 6	4 80	4 65	4 5	4 55	4 55	4 26	4 26	4 6 4	4 65	4 80	4 2(	+ 15	− 29
4 80	4 2	4 84	4 61	4 65	4 48	4 55	4 5	4 6 4	4 66	4 72	4 26	+ 06	− 4(
4 69	4 80	4 55	4 51	4 6	4 44	4 41	4 41	4 6	4 64	4 80	4 49	+ 16	− 15
4 2	4 48	4 61	4 44	4 61	4 48	4 38	4 38	45	4 56	4 48	4 1	− 08	− 41
4 84	4 61	4 69	4 2	4 44	4 51	4 38	4 38	4 6 1	4 63	4 61	4 38	− 02	− 25
4 61	4 72	4 80	4 51	4 58	4 51	4 29	4 29	4 6 1	4 63	4 72	4 4	+ 09	− 15
4 51	4 48	4 6	4 61	4 38	4 55	4 55	4 55	4 6 1	4 62	4 48	4 1	− 14	− 45
4 65	4 48	4 38	4 44	4 35	4 32	4 55	4 55	44 8	4 50	4 48	4 26	− 02	− 24
4 6	4 51	4 6	4 69	4 55	4 55	4 6	4 61	46	4 64	4 51	4 21	− 13	− 4(
4 48	4 38	4 51	4 72	4 38	4 32	4 1	4 1	4(8	4 60	4 38	4 32	− 22	− 28
4 65	4 55	4 51	4 48	4 51	4 55	4 29	4 29	46 8	4 61	4 55	4 46	− 06	− 1
4 69	4 80	4 84	4 65	4 51	4 58	4 65	4 65	46 8	4 69	4 80	4 15	+ 11	− 54
4 72	4 58	4 48	4 55	4 38	4 29	4 61	4 61	4(6	4 64	4 59	4 12	− 05	− 5
4 84	4 2	4 58	4 38	4 22	4 26	4 29	4 29	4(1	4 58	4 73	4 36	+ 15	− 2
4 69	4 55	4 6	4 55	4 38	4 38	4 22	4 22	4(0	4 60	4 57	4 36	− 03	− 24
36	42	46	37	43	32	48	48	1	19	42	3	38	41
4 60	4 61	4 64	4 ( )	4 48	4 4(	4 4°	4 4	4(8	4 61	4 6°	4 31	+ 01	− 3(
4 72	4 69	4 64	4 56	4 47	4 35	4 22	4 2	45	4 60	4 69	.	+ 09	..
− 03	− 08	00	− 01	+ 01	+ 10	+ 20	+ 2(	+ 1	+ 01	− 0		− 08	..
4 32	4 38	4 26	4 29	4 03	4 17	.	4 24	41 6	4 ( )	4 36	3 86	+ 04	− 4(
4 55	4 14	4 35	4 0)	4 00	4 14		4 2	40 4	4 26	4 25	4 26	− 01	− 00
4 32	4 ,8	3 90	4 20	3 90	4 05		4 12	40(	4 21	4 36	4 1(	+ 15	− 11
4 26	4 1	4 26	4 14	4 08	4 05		4 04	40	4 25	4 19	3 92	− 06	− 3
4 32	4 20	4 29	4 22	4 29	4 22		4 1)	40 (	4 28	4 23	4 1	− 05	− 11
4 ,8	4 32	4 20	4 14	4 22	4 14	..	4 10	40	4 30	4 34	4 12	+ 04	− 18
4 51	4 44	4 22	4 2)	4 08	4 35	.	44	41	4 5	4 46	4 1	+ 11	− 18
4 32	4 29	4 35	4 11	4 38	4 17	.	4 08	40 8	4 33	4 30	4 20	− 02	− 1
4 35	4 44	4 22	4 17	4 0)	4 22	..	4 30	40 .	4 2	4 4	4 21	+ 15	− 0(
4 22	4 14	4 08	3 97	3 87	4 14	.	4 2(	39 4	4 1 4	4 16	39	− 01	− 0(
4 26	4 14	4 35	4 6	3 95	4 03	..	4 0(	39 5	4 22	4 1 4	4 0)	− 05	− 15
4 48	4 44	4 1	4 22	4 22	4 35	..	4 3)	40 4	4 33	4 45	4 12	+ 12	− 21
4 55	4 29	4 26	4 26	4 1 4	4 14	.	4 1 (	40(	4 29	4 35	4 1	+ 09	− 18
4 35	4 58	4 38	4 08	4 1 4	4 17	..	4 1	40 (	4 33	4 50	38	+ 17	− 4(
4 2(	4 35	4 14	4 05	4 00	39	.	39(	38	4 19	4 32	3 9 (	+ 13	− 0(
4 08	4 17	4 44	4 11	4 11	4 03		4 01	39 (	4 24	4 25	4 33	+ 01	+ 09
33	44	54	32	51	38		51	2 (	18	34	4	03	55
4 00	4 00	4 04	4 16	4 10	4 1 (	..	4 1	40 0	4 0	4 02	4 0	+ 0(	− 1
4 36	4 33	4 0 8	4 0 0	4 10	3 98		39	40 1	4 0	4 34		+ 05	
00	− 03	− 04	− 04	00	+ 17		+ 25	+ 1	+ 01	− 0°		− 03	

SUBSURFACE AND MEAN VELO-

Solání Right Aqueduct—

[*Instruments*—1⅝" *Double-Floats,*

Serial No.	Date, 1876.	2 Depth Actual H	2 Depth Variation	2 Length of Rod l	3 Fall of Water-Surface. Upper ¼ miles. F_1	3 Fall of Water-Surface. Lower ¼ miles F_2	3 Fall of Water-Surface. Local Slope. S	4 Wind. From Direction.	4 Wind. From Velocity	4 Wind. To Direction.	4 Wind. To Velocity.	5 Timekeeper's Initial.	Subsurface past the cen- Rod Velocity in the Nominal 0	1	2	3
Series 7.	23-3-76	8·93	·00	8	5·80	4·93	19	NE	6	..	0	W	4·17	4·20	4·35	4·32
	17-3- "	·93	·00	8	5·80	4·83	?	S	5	S & W	10	H	4·51	3·77	4·20	4·29
	"	·93	·00	8	"	"	?	S & W	10	S & W	10	W	4·00	4·20	4·26	4·03
	15-3- "	·83	·00	8	5·75	4·83	?	SW	8	W	6	W	4·08	4·22	4·22	4·14
	"	·83	·00	8	"	"	?	W	6	S & W	10	H	4·38	4·05	4·08	4·03
	"	·83	·00	8	"	"	?	S & W	10	S	11	W	3·95	4·08	4·05	4·11
	"	·83	·00	8	5·80	"	?	S	11	S	.	H	3·90	4·17	4·20	4·35
	"	·83	·00	8	"	"	?	S	5	S	5	W	4·05	4·17	4·20	3·97
	"	·83	·00	8	"	"	?	S	9	SSW	15	H	3·64	4·11	4·00	4·06
	16-3- "	·83	·00	8	5·75	4·83	?	..	0	..	0	W	4·08	4·00	4·08	4·11
	"	·83	·00	8	"	"	?	..	0	..	0	H	4·22	3·90	4·08	4·05
	"	·83	·00	8	"	"	?	S	4	S	6	W	4·11	4·05	4·05	4·03
	"	·83	·00	8	"	"	?	S	6	S	12	H	4·29	4·29	4·17	4·03
	14-3- "	·80	·00	8	5·80	4·80	?	W	5	..	0	H	4·00	4·26	4·03	4·17
	"	·80	·00	8	"	"	?	..	0	..	0	W	4·17	4·22	4·35	4·38
	"	·83	·00	8	5·85	4·85	?	S	5	S	17	H	3·95	4·11	4·20	4·26
	18-3- "	·80	·00	8	5·80	4·90	?	..	?0	..	?0	W	3·97	4·00	4·08	4·05
	"	·80	·00	8	"	"	?	S	14	..	0	H	3·85	3·77	4·08	4·11
δ	Range,	·15	..	0	·10	·15	?	..	..	..	..	..	·87	·52	·38	·41
v	Means of 14,	8·83	..	8	5·80	4·86	?	S & W 5				..	4·07	4·09	4·15	4·14
v'	Parabolic, (r')	..	..	..	..	..	..	..	..	..	..	..	4·07	4·11	4·13	4·13
Δ	Discrepancies, (v − v')	..	..	..	..	..	..	..	..	..	..	..	·00	−·02	+·02	+·01
Series 8.	23-4-76	8·53	·00	8	5·82	4·73	20	..	0	..	0	H	4·03	4·08	4·05	4·03
	"	53	·00	8	"	"	"	..	0	..	0	W	4·17	4·11	4·14	4·08
	"	53	·00	8	"	"	"	..	0	..	0	H	4·03	3·97	4·20	4·14
	"	53	·00	8	"	"	"	..	0	..	0	W	4·05	4·22	4·08	4·14
	"	53	·00	8	"	"	"	..	0	..	0	H	3·93	4·11	4·26	4·17
	"	53	·00	8	"	"	"	..	0	..	0	W	4·00	4·29	4·14	3·97
	21-4- "	43	·00	8	5·85	4·65	20	..	0	..	0	H	3·85	4·05	4·05	4·05
	"	43	·00	8	"	"	"	..	0	N & E	13	W	4·08	4·11	4·11	4·17
	"	43	·00	8	"	"	"	N & E	11	NE	10	H	4·05	4·11	4·11	3·77
	"	43	·00	8	"	"	"	NE	10	NE	14	W	3·97	4·11	3·90	4·00
	19-4- "	·90	·00	8	5·80	4·50	20	..	0	..	0	H	4·00	3·90	4·05	4·05
	"	·90	·00	8	"	"	"	..	0	..	0	W	3·93	4·17	4·29	3·90
	20-4- "	·90	·00	8	5·80	4·90	20	..	0	..	0	H	4·00	4·26	4·08	4·29
	"	·90	·00	8	"	"	"	..	0	..	0	W	4·00	4·08	4·11	4·03
	"	·90	·00	8	"	"	"	..	0	NNE	7	H	4·05	4·14	3·93	4·03
	"	·90	·00	8	"	"	"	NNE	7	V	1	W	4·29	4·32	3·95	4·20
δ	Range,	23	..	0	03	·23	00.	..	..	..	.	..	·42	·42	·39	·32
v	Means of 14,	8·42	..	8	5·82	4·62	20.	NE & N 2				..	4·03	4·13	4·09	4·07
v'	Parabolic, (r')	..	..	..	..	..	..	..	..	..	..	..	4·06	4·09	4·10	4·05
Δ	Discrepancies, (v−v')	..	..	..	..	..	..	..	..	..	..	..	−·03	+·01	−·01	−·01

CITIES PAST A VERTICAL — TABLE X

Central Vertical

and 1″ tin Tube-Rods]

6								7	8			9	
Velocities tral vertical mean of three observations). Depths (z)							Bed velocity	Discharge past the vertical	Mean Velocity past the vertical. Various Approximat ons Discharge / Depth	Mid-depth Velocity	Root Velocity Mean of 6 trials	Differences	
4	5	6	7	8	9	10	v_B	D	U	$v_{\frac{1}{2}H}$	v	$(v_{\frac{1}{2}H} - U)$.	$(v - U)$
4·38	4·05	4·11	3·80	3·73	..	..	3·66	36·5	4·07	4·22	4·00	+ ·15	− ·07
4·17	4·05	3·95	3·97	3·82	..	.	3·68	35·6	4·02	4·12	3·91	+ ·10	− ·11
4·17	4·08	4·05	3·85	3·87	..	..	3·89	36·0	4·04	4·13	3·96	+ ·09	− ·08
4·17	4·05	4·08	3·97	3·73	..	..	3·53	35·3	4·05	4·12	3·93	+ ·07	− ·12
4·05	3·95	3·95	3·92	3·75	..	..	3·6	35·2	3·97	4·01	3·7	+ ·04	− ·26
4·20	4·03	3·82	3·75	3·61	.	..	3·49	34·9	3·94	4·13	3·59	+ ·19	− ·15
4·35	4·20	3·82	3·87	3·90	..	..	3·93	36·3	4·11	4·29	3·82	+ ·18	− ·29
4·00	4·11	3·85	3·90	3·77	..	..	3·61	35·3	3·99	4·05	3·76	+ ·06	− ·23
3·95	4·08	3·95	3·85	3·70	.	.	3·5	35·2	3·98	4·01	3·85	+ ·03	− ·10
4·05	3·85	4·05	3·70	3·68	.	..	3·66	34·7	3·92	3·96	3·86	+ ·04	− ·06
4·11	3·82	3·85	4·05	3·77	..	..	3·53	34·9	3·94	3·99	3·76	+ ·05	− ·18
3·95	3·85	3·85	3·82	3·70	..	..	3·60	34·0	3·91	3·91	3·8	·00	− ·04
4·05	4·11	4·03	3·90	3·82	.	..	3·75	35·9	4·05	4·08	3·80	+ ·03	− ·25
4·03	3·92	4·14	3·85	3·68	..	..	3·54	35·2	4·00	3·99	3·88	− ·01	− ·17
4·20	3·90	3·92	3·90	3·85	..	..	3·8	35·9	4·08	4·08	3·93	·00	− ·15
3·95	4·22	4·00	4·03	3·75	..	..	3·51	35·3	4·06	4·07	3·86	+ ·01	− ·21
4·11	4·11	4·00	3·73	3·66	..	..	3·60	34·8	3·95	4·11	3·8	+ ·16	− ·05
3·97	3·92	3·92	3·85	3·59	..	..	3·38	34·1	3·88	3·95	3·75	+ ·07	− ·13
·43	·40	·32	·35	·31	..	..	·55	2·4	·23	·38	·29	·20	·25
4·10	4·02	3·96	3·87	3·74	..	..	3·64	35·4	4·00	4·07	3·85	+ ·07	− ·15
4·10	4·04	3·96	3·86	3·73	..	..	3·60	35·4	4·00	4·08	..	·08	..
·00	− ·02	·00	+ ·01	+ ·01	.	..	+ ·03	0	·00	− ·01	..	− ·01	..
3·90	3·87	3·85	3·82	3·66	..	..	3·58	33·4	3·92	3·89	3·81	− ·03	− ·11
4·08	3·90	3·75	3·47	3·82	..	..	4·01	33·8	3·92	4·03	3·71	+ ·11	− ·21
4·29	3·85	3·82	3·92	3·68	..	..	3·55	33·6	3·97	4·17	3·73	+ ·20	− ·24
4·22	3·92	4·06	3·7	3·75	..	..	3·74	34·2	4·01	4·14	3·76	+ ·13	− ·25
4·03	4·11	3·95	3·97	3·85	..	..	3·79	34·6	4·05	4·05	3·70	·00	− ·35
4·08	4·00	3·87	3·75	3·75	..	..	3·7	34·6	3·98	4·06	3·82	+ ·08	− ·16
3·82	3·90	3·91	3·77	3·95	..	..	4·05	33·4	3·95	3·84	3·86	− ·11	− ·09
4·08	3·87	3·55	3·57	3·73	..	..	3·80	33·1	3·92	4·03	3·71	+ ·11	− ·21
4·00	4·11	3·97	3·75	3·53	.	..	3·4	33·1	3·93	4·05	3·71	+ ·11	− ·21
3·92	4·00	3·82	3·73	3·75	..	..	3·76	33·1	3·92	3·94	3·9	+ ·02	−·00
4·03	3·97	3·87	3·0	3·64	.	..	3·62	32·4	3·91	4·02	3·71	+ ·11	− ·20
3·80	3·85	3·49	3·64	3·47	..	..	3·42	32·0	3·85	3·81	3·8	− ·04	− ·0
4·26	3·95	3·68	3·75	3·70	..	..	3·68	33·4	4·02	4·11	3·85	+ ·19	− ·1
4·11	4·03	3·85	3·80	3·77	..	..	3·76	33·0	3·98	4·10	3·79	+ ·12	− ·1
3·97	4·03	4·03	3·73	3·64	..	..	3·61	32·6	3·96	3·98	3·9	+ ·02	− ·1
4·01	3·95	3·70	3·68	3·51	.	..	3·46	33·0	3·97	4·02	3·70	+ ·05	− ·2
·49	·26	·59	·50	·48	..	..	·61	2·0	·90	·40	2·0	·31	·3
4·04	3·96	3·83	3·74	3·70	..	..	3·6	33·3	3·95	4·00	3·7	+ ·07	− ·1
4·03	3·96	3·87	3·75	3·61	.	..	3·54	33	3·95	4·02	..	+ ·07	..
+ ·01	·00	− ·04	− ·01	+ ·09	..	..	+ ·1	0	·00	·00	..	·00	..

[*Instruments*—$1\frac{5}{8}$″ *Double-Floats*,

Serial No	1 Date, 1875—79	2 Depth. Actual. H	Variation.	Length of Rod. l	3 Fall of Water-Surface. Upper 5 miles. F_1	Lower 4½ miles. F_2	Local Slope. S	4 Wind. From Direction.	From Velocity.	To Direction.	To Velocity.	5 Timekeeper's Initial.	Subsurface past the centre. [Each Velocity is the Nominal. 0	1	2	3
Series 9.	22-10-'78	8 21	− 02	7′	6 31	4 11	17.	NNW	4	..	0	R	4 80	4 80	4 69	4 84
	5-4-'7	28	00	7½	5 82	4 11	20[illegible]	..	0	..	0	Cl	4 17	4 41	4 17	4 35
	30-6-'70	30	00	8	5 90	4 60	?	..	0	..	0	H	4 29	4 08	4·05	4 14
	" "	30	00	8	"	"	?	..	0	..	0	W	4 22	4 14	4 14	4 32
	" "	·30	00	8	"	"	?	..	0	..	0	H	4 17	4·26	4 22	4 35
	" "	30	00	8	"	"	?	..	0	SW	6	W	4 22	4 20	4 26	3 97
	11-7-"	27	00	8	5 98	4 57	?	..	0	..	0	H	4 20	4 41	4 55	4 41
	" "	29	+ 03	8	5 96	4 59	?	..	0	S	5	W	4 32	4 41	4 38	4 38
	" "	32	+ 04	8	5 93	4 62	?	S	5	S	4	H	4 20	4 35	4 48	4 26
	" "	36	+ 04	8	5 89	4 66	?	S	4	S	6	W	4 14	4 38	4 38	4 51
	" "	·33	+ 01	8	5 86	4 69	?	S	9	S	7	H	3 82	4 41	4 41	4 58
	" "	40	+ 01	8	5 85	4 70	?	S	5	S	4	W	4 41	4 58	4 39	4 48
	" "	42	+ 03	8	5 83	4 72	?	S	4	..	0	H	4 35	4 51	4 41	4 61
	23-10-'78	40	00	8	6 00	4 30	143	SW	1	..	0	P	4 44	4·69	4 65	4 72
δ	Range,	21	..	·5	69	61	?	..	..	..	..	..	·98	·72	·64	87
v	Means of 14,	8 32	..	7 9	5 98	4 53	?	S & W 2				..	4 28	4 40	4 37	4 42
v′		Parabolic, (v′)			..	..	..	..	..	..		..	4 31	4 36	4 38	4 37
Δ		Discrepancies, (v − v′)			..	..	..	..	..	..		..	− 03	+ 04	− 01	+ 05
Series 10	17-7-'70	8 16	− 02	7	5 99	4 46	Not observed	..	0	..	0	W	4 55	4 58	4 38	4 41
	" "	·10	− 10	7	6·05	4 40		..	0	SE	4	H	4 38	4 76	4 35	4 35
δ	Range,	06	..	0	·06	06		..	..	..	..	..	·17	18	·03	·06
v	Means of 2,	8 13	..	7	6 02	4 43		SD 1				..	4 47	4 67	4 37	4 38
Series 11.	29-6-'70	7 80	·00	7	5 90	4 25	?	SSW	6	W & N	4	W	38,	4 00	4·03	4·05
	" "	·80	·00	7	"	"	?	W & N	4	..	0	H	38,	3 97	4 11	3 95
	" "	80	·00	7	"	"	?	..	0	..	0	W	4 17	4 11	3·97	4 11
	" "	80	·00	7	"	"	?	..	0	..	0	H	4 08	3 70	4·05	4 11
	" "	80	00	7	"	"	?	..	0	W	6	W	4 05	38,	4 17	4·03
	" "	·80	·00	7	"	"	?	W	6	W	11	H	4·05	4 14	38,	4 20
	" "	·80	·00	7	"	"	?	W	11	W	10	W	38,	4 39	4·03	4 26
	27-6-"	·79	− 02	7	5·81	4 29	210	..	0	..	0	W	3 93	4 21	4 14	4 17
	" "	·77	− 02	7	5 83	4 27	"	..	0	..	0	H	4 20	4 32	4 14	4 32
	" "	76	·00	7	5·84	4 26	"	..	0	..	0	W	4 17	4 20	4 00	4·05
	28-6-"	·68	·00	7	5 82	4 18	21	..	0	..	0	H	4 22	4 29	4 08	4 14
	" "	·68	·00	7	"	"	"	..	0	..	0	W	4 14	4 11	4 11	4·23
	" "	·67	− 03	7	5·83	4 17	"	..	0	..	0	H	4·08	4 05	4 17	4 26
	" "	62	·00	7	5 85	4 13	"	..	0	..	0	W	4·05	4·03	4·08	4·05
	" "	64	−·03	7	5 86	4 14	"	..	0	..	0	H	3·95	4 03	4·03	4 17
δ	Range,	·16	..	0	·03	·15	?	..	..	..	..	..	·37	·42	·30	·37
v	Means of 13,	7 73	..	7	5 86	4 23	?	W 2				.	4·05	4 10	4 07	4 14
v′		Parabolic, (v′)			..	..	..	..	..	..		..	4 05	4 10	4 11	4 10
Δ		Discrepancies (v − v′)			..	..	..	..	..	..		..	00	00	− 04	+ 04

TABLE XI

CITIES PAST A VERTICAL

CENTRAL VERTICAL

and 1" tin Tube-Rods]

6								7	8			9	
VELOCITIES trial vert cal. mean of three observations] Depths (x)							Bed velocity	DISCHARGE past the vertical	MEAN VELOCITY past the vertical Various Approximat ons.			DIFFERENCES	
									Discharge / Depth	Mid-depth Velocity.	Rod Velocity Mean of 6 trials		
4	5	6	7	8	9	10	v_n	D	U	$v_{\frac{1}{10}}$	u	$(v_{\frac{1}{10}} - U)$	$(u - U)$.
4 65	4 ,6	4 61	4 69	4 55	..	..	4 52	38 8	4 73	4 66	4 44	− 07	− 29
4 17	4 0ɔ	38,	3 75	3 75	..	..	37	33 '	4 10	4 15	4 01	+ 05	− 09
4 11	3 9ɔ	3 85	4 17	3 ,0	..	..	3 5(	33 (	4 04	4 09	3 96	+ 05	− 08
4 26	4 1,	4 11	3 80	3 85	..	..	38	34 1	4 11	4 25	3 (6	+ 14	− 45
3 80	3 9ɔ	4 00	3 90	3 90	..	..	3 90	33 8	4 07	3 82	3 95	− 25	− 1?
4 03	4 03	4 83	3 73	3 68	..	..	3 66	33 1	3 98	4 03	3 83	+ 05	−·15
4 14	4 22	4 14	4 08	4 00	..	..	3 98	3ɔ	4 25	4 15	3 77	− 10	− 48
4 20	4 22	4 20	3 97	3 95	..	..	3 94	35 1	4 23	4 20	3 92	− 03	− 31
4 35	4 22	4 29	3 97	3 95	..	..	3 94	3ɔ 1	4 22	4 33	3 93	+ 11	− 29
4 20	4 26	4 14	4 00	3 87	..	..	38	3ɔ 4	4 24	4 21	4 05	− 03	− 19
4 3ɔ	4 41	4 14	3 95	4·00	..	..	4·02	3ɔ '	4·28	4 3(	3 96	+ 08	−·3?
4 41	4 32	4 26	3 95	4 11	..	..	4 1,	36	4 32	4 39	4 00	+ 07	− 32
4 22	4 14	4 38	3 95	4 29	..	..	4 4ɔ	36 4	4 32	4 20	4 11	−·12	− 21
4 61	4 72	4 61	4 48	4 26	..	..	4 1,	38 7	4 60	4 63	4·0,	+ 03	− 53
85	81	98	96	87	..	..	·96	5 "	75	84	76	39	45
4·2ɔ	4 24	4 2ɔ	4 03	3·99	..	..	3 98	3ɔ 4	4 32	4 25	3 98	− 07	− 34
4 33	4 27	4 19	4 07	3 93	.	..	3 88	35 4	4 23	4 33	..	+ 08	..
− 08	− 03	+ 06	− 04	+ 06	..	.	+ 10	(	+ 07	− 08	..	− 15	..
4 55	4 55	4 38	4 35	4 25	..	..	4 23	36	4 45	4 55	4 05	+ 10	−·40
4 48	4 35	4 20	4 22	3 90	..	..	38	3ɔ 4	4 3,	4 47	4 01	+ 10	− 36
07	20	18	13	35	..	..	36	9	08	08	04	00	04
4 5°	4 15	4 20	4 29	4 08	..	..	4 0ɔ	3ɔ J	4 41	4 ɔ1	4 03	+ 10	− 3?
4 00	3 68	3 8(	3 73	..	..	..	3 (3	30 3	3 88	4 00	3 6	+ 12	− 21
3 85	3 85	3 92	ɔ 82	..	..	..	3 74	ɔ0	3 91	3 86	3 69	− 05	− 2
4 14	3 87	3 80	ɔ 61	..	..	..	3 46	30 "	3 94	4 14	3 7,	+ 20	− 21
4 00	4 00	3 87	3 70	..	..	..	3 5(	30	3 94	4 01	ɔ 8,	+ 07	− 11
4 0	3 92	3 64	ɔ 83	..	..	..	3 9(	3 ((	3 92	4 03	3 88	+ 11	− 04
4 00	3 90	3 80	3 (	..	..	..	3 71	31 1	3 9)	4·02	3 "	+ 03	− 2
4 03	3 87	3 75	3 66	..	..	..	3 59	31	4 00	4 (	3 8(	+ 05	− 1
4 00	4 05	3 17	3 70	..	..	..	34	31,	4 04	4·01	3 80	− 02	− 24
4 17	3 95	4 00	3 77	..	..	..	3 59	31 7	4·08	4 19	3 86	+ 11	− 2
4 14	4 11	3 ɔ0	3 66	..	..	..	3 5(	31 1	4·00	4 13	3 8(	+ 13	− 1
3 92	4 44	3 61	3 80	.	.	..	3 9ɔ	31 (	4 12	3 96	3 "	− 16	− 3(
4 14	4 14	4·00	3 80	..	..	..	3 6(	31	4·08	4 15	3·9	+·07	− 1
3 97	3 92	3 (	3 70	..	..	..	36,	30·(	4 00	4·02	3 68	+ 02	− 3
4 22	3 95	3 80	3 77	..	..	..	3 7(	30	3 96	4 19	3 "	+ 23	− 1
4 14	4·00	3 80	3 (5	..	..	..	3 8(	30	4·02	4 15	3 86	+ 13	− 16
37	76	39	·24	..	..	..	52	1 4	24	33	24	39	·34
4 0ɔ	3 9(	3 92	3·74	..	..	..	3·6	30	3 99	4·06	3·7	+·07	− 2(
4 03	3 97	3 86	3 72	..	..	..	3 5(	30·(	3·98	4·06	..	+ 05	..
00	+ 01	− 04	+ 02	..	..	..	+·0	(	+·01	·00	..	−·01	..

SUBSURFACE AND MEAN VELO-

Solaní Right Aqueduct—

[*Instruments* { *No. 12. 3″ Double-Floats,*
No. 13. 1⅞″ Double-Floats,

Serial No.	1 Date, 1875—76.	2 Depth. Actual. H	2 Depth. Variation	2 Length of Rod. l	3 Fall of Water Surface. Upper ¼ miles. F_1	3 Fall of Water Surface. Lower ¼ miles. F_2	3 Fall of Water Surface. Local Slope S	4 Wind. From Direction.	4 Wind. From Velocity.	4 Wind. To Direction.	4 Wind. To Velocity.	5 Timekeeper's Initial	Subsurface past the centre. (Each Velocity is the Nominal) 0	1	2	3
Series 12.	22 2 '75	7 05	00	7	5 75	4 15	Not observed.	..	0	V	15	W	4 00	3·90	3 66	3·90
	" "	6	00	7	"	"		V	15	NE	20	R	4 05	3·85	4 00	4·05
	26-2- "	60	·00	7	5 60	4 10		V	13	E	14	W	3 85	4·00	3 85	3 80
	" "	60	00	7	"	"		V	13	NW	8	R	3 75	3 75	3 75	3 80
	" "	60	00	7	"	"		NW	8	W	17	W	3 66	3 80	3 75	3 61
	" "	60	·00	7	"	"		W	17	W	20	R	3 80	3 70	3·95	3 90
	" "	60	00	7	"	"		E	17	W	2	W	3 61	3·75	3 85	3 85
	" "	60	·00	7	"	"		W	22	V	17	R	3 95	3 85	3 90	3 85
	24-2- "	5	00	7	5 85	4 05		..	0	..	0	W	3 75	3 80	3 95	3·95
	" "	58	+·05	7	5 82	4·08		..	0	SE	6	R	3·66	3 85	3 75	3 70
	" "	60	00	7	5·80	4 10		SE	6	SE	6	W	3 61	3·85	4·00	3 61
	" "	60	00	7	"	"		SE	9	SE	20	R	3·70	3·90	3 75	3 75
	" "	60	·00	7	"	"		SE	20	SE	1	W	3 70	3 75	3·90	3 70
	" "	60	·00	7	"	"		SE	19	S	15	R	3 70	3·90	3 90	3 90
	23-2- "	55	00	7	5·85	4·05		..	0	..	0	W	3 80	3 95	3·85	3 75
	" "	55	00	7	"	"		..	0	..	0	R	3 75	3 85	3 80	3·95
	" "	55	00	7	"	"		..	0	..	0	W	3 85	3·85	3 90	3 66
	" "	55	·00	7	"	"		..	0	..	0	R	3 90	3 95	3 80	4·00
	" "	55	00	7	"	"		..	0	..	0	W	3 95	3 85	3·80	3 70
	" "	55	·00	7	"	"		..	0	..	0	R	3·90	4 05	3 95	3 75
δ	Range,	·10	..	0	10	·10	..	..	..	..	..	..	·11	·33	·34	·41
v	Means of 20,	7 59	..	7	5·81	4·09	..		S 8 E 2			..	3·80	3·86	3·85	3·81
v′		Parabolic, (v′)											3 81	3·85	3 85	3 80
Δ		Discrepancies, (v — v′)											− 01	+ 01	00	+ 01
Series 13.	21 7-'76	7 11	+ 02	6	6·09	3·81	23(	..	0	..	0	W	4 14	4 20	4·05	3·97
	" "	14	+ 03	6	6·06	3·84	"	..	0	..	0	R	4·00	4·03	4 14	4 20
	" "	16	+ 02	6	6·04	3 86	"	..	0	..	0	W	3 83	4 14	4 14	4 00
	" "	17	00	6	6·03	3·87	"	..	0	..	0	R	4 22	4 17	4 22	4 11
δ	Range,	06	..	0	06	06	00(	..	..	..	..	..	·40	·17	·17	23
v	Means of 4,	7 12	..	6	6·06	3·85	23(		0			..	4·05	4 14	4 14	4·07
v′		Parabolic, (v′)											4 06	4 12	4 13	4 11
Δ		Discrepancies, (v — v′)											− 01	+ 02	+ 01	− 04

TABLE XII.

CITIES PAST A VERTICAL.

CENTRAL VERTICAL.

and 1″ wood Rods
and 1″ tin Tube Rods].

6								7	8			9	
VELOCITIES tral vertical. mean of three observations]. Depths (x)							Red velocity	DISCHARGE past the vertical.	MEAN VELOCITY past the vertical. Various Approximations			DIFFERENCES	
									Discharge / Depth	Mid depth Velocity	Rod Velocity Mean of 6 trials		
4	5	6	7	8	9	10	v_H	D	U	v_{1H}	u	$(v_{1H} - U)$	$(u - U)$.
3 53	3 66	3 53	3 33	..	..	..	3 20	28 0	3 70	3 59	3 70	− 11	00
3 90	3 61	3 70	3 29	..	..	..	3 02	28 7	3 75	3 93	3 66	+ 18	− 09
3 57	3 41	3 66	3 16	..	..	..	2 86	27 7	3 64	3 62	3 61	− 02	− 03
3 57	3 66	3 41	3 23	..	..	..	3 12	27 5	3 62	3 62	3 45	00	−·17
3 66	3 49	3 33	3 26	..	..	..	3 22	27 0	3 55	3 65	3 41	+ 10	− 14
3 80	3 57	3 57	3 16	..	..	..	2 91	28 7	3 77	3 82	3 61	+ 05	− 16
3 75	3 41	3 41	3 13	..	..	..	2 96	27 9	3 57	3 77	3 75	+ 20	+ 18
3 57	3 61	3 41	2 97	..	..	..	2 71	27 0	3 61	3 63	35	+ 02	− 08
3 95	3 53	3 37	3 23	..	..	..	3 15	27 7	3 66	3 95	3 49	+ 29	− 17
3 80	3 75	3 45	3 30	..	..	..	3 21	27 7	3 66	3 78	3 61	+ 12	− 05
3 80	3 45	3 45	3 16	..	..	..	2 99	27 1	3 56	3 76	3 66	+ 20	+ 10
3 75	3 70	3 45	3 03	..	..	..	2 ,8	27 5	3 62	3 75	3 49	+ 13	−·13
3 66	3 75	3 45	3 12	..	..	..	2 92	27 4	3 61	3 67	3 57	+ 06	− 04
3 53	3 41	3 53	3 03	..	..	..	2 73	27 4	3 60	3 60	3 70	00	+ 10
3 61	3 61	3 49	2 97	..	..	..	2 68	27	3 62	3 64	3 66	+ 02	+·04
3 70	3 53	3 53	3 12	..	..	..	2 89	27 0	3 66	3 76	3 49	+ 10	− 17
3 45	3 75	3 37	3·09	..	..	..	2·94	27 3	3 61	3 50	3 23	− 11	− 38
3 75	3 66	3 49	3 30	..	..	..	3·20	28	3 75	3·81	3 80	+ 06	+ 05
3 61	3 70	3 49	3 23	..	..	.	3 09	27 3	3 65	3 63	3 49	− 02	− 16
3·66	3 75	3 53	3 26	..	..	..	3 11	28·1	3 72	3 68	3 5,	− 04	− 15
50	34	·37	36	..	..	..	54	1 7	22	45	37	40	50
3 68	3 60	3 48	3 17	..	..	..	2 98	27 7	3 65	3 71	3 57	+·06	−·08
3 72	3 59	3 43	3 22	..	..	..	3 08	27 6	3 64	3 74	..	+ 10	..
− 04	+ 01	+ 05	− 05	..	..	..	−·10	+ 1	+ 01	− 03	..	− 04	..
4·08	4 00	3 73	3 57	..	..	..	3 55	28·4	3·98	4 03	3·8	+·05	− 11
4·05	3 87	3 75	3 61	..	..	..	3 59	28 4	3·97	4 11	3·8	+ 14	− 14
3 97	3·90	3 70	3 70	..	..	..	3 72	28	3 94	3·98	3 86	+ 04	−·08
4 14	4 11	3 73	3 70	..	..	..	3·69	29·1	4·05	4 13	3 86	+ 08	−·09
17	24	05	13	..	..	..	15	9	·11	15	04	10	·11
4·06	3·97	3·73	3·65	..	..	..	3·6.	28·3	3·99	4·06	3·86	+·07	− 13
4 04	3·94	3 79	3·60	..	..	..	3 57	28·3	3 99	4·08	..	+·09	..
+ 02	+·03	− 06	+ 05	..	..	..	+·06	0	00	− 02	..	−·02	..

SUBSURFACE AND MEAN VELO-

Solani Right Aqueduct—

[*Instruments*—1¾″ *Double-Floats*,

Serial No.	1 Date 1876 & 77	2 Depth. Actual. H	2 Depth. Variation.	2 Length of Rod. l	3 Fall of Water-Surface. Upper ¼ miles F_1	3 Fall of Water-Surface. Lower ¼ miles F_2	3 Fall of Water-Surface. Local Hl. ps. s	4 Wind. From Direction.	4 Wind. From Velocity.	4 Wind. To Direction.	4 Wind. To Velocity.	5 Timekeeper at Initial	Subsurface past the centre (Each Velocity in the Normal) 0	1	2	3
Series 14.	7-1-76	6·91	+·05	6	5·94	3·21	2·12	..	0	S	2	G	3·97	4·14	3·97	4·00
	"	"	-·00	6	5·92	3·19	"	S	3	SW	2	P	4·00	4·00	4·14	4·00
	"	"	-·03	6	5·93	3·12	"	SW	8	S	6	G	3·97	4·08	3·90	4·00
	8-1-	"	-·00	6	5·90	3·20	"	S	6	S	9	P	3·75	4·11	4·03	4·14
	"	"	-·00	6	"	"	"	S	9	S	1	G	3·87	3·97	3·97	4·03
	"	"	-·00	6	5·95	3·15	?	W	4	W	4	G	3·97	3·90	3·90	4·00
	12-1-76	"	-·00	6	"	"	?	W	4	SW	3	P	3·72	4·29	4·06	4·03
	"	"	-·00	6	6·00	3·33	?	NNE	0	..	0	W	4·20	4·14	4·20	4·11
	"	"	-·00	6	"	"	?	..	0	..	0	H	4·06	4·22	4·13	4·00
	11-1-76	"	-·00	6	5·95	3·18	?	NE	10	E	10	H	3·70	4·00	3·97	4·03
	"	"	-·00	6	5·97	3·03	?	W	8	W	8	P	3·68	3·97	4·22	4·03
	"	"	-·00	6	"	"	?	W	8	S	5	G	3·87	3·97	3·97	4·11
	"	"	-·00	6	"	"	?	S	5	NE	2	P	3·82	3·80	4·03	3·86
	"	"	-·00	6	"	"	?	NE	8	S	5	G	3·77	3·92	4·0_	3·87
	"	"	-·00	6	"	"	?	S	5	S	11	P	3·51	3·92	4·17	3·87
	"	"	-·00	6	"	"	?	S	11	V	7	G	3·70	3·96	3·95	3·87
z	Range.	·30	..	0	·03	·32	?	..	..	..		.	·75	·49	·39	·27
v	Means of M.	6·11	..	6	5·96	3·19	?			S 5 W 3		..	3·96	4·02	4·06	4·00
v′			Parabolic, (v)		..	..		..	..	..	..	..	3·89	3·95	4·03	4·01
Δ			Discrepancies, (v − v′)		..	..		..	..	..	..	..	−·03	+·04	+·03	−·01
Series 15.	23-7-76	6·[illegible]	-·03	6	6·05	2·[illegible]	Not observed.	N	6	N	6	W	4·11	4·22	4·20	4·26
	"	"	-·03	6	"	"	"	N	6	N	4	H	4·17	4·22	4·29	3·92
	"	"	-·03	6	"	"	"	N	4	N	0	W	4·14	4·[illegible]	4·17	4·22
	"	"	-·03	6	"	"	"	N	0	N	10	H	4·22	4·29	4·[illegible]	4·20
	"	"	-·00	6	"	"	"	N	10	N	10	W	4·17	4·26	4·29	4·29
	12-10-76	"	-·00	6	"	"	"	N	10	N	1	H	4·41	4·05	4·31	4·29
	"	"	-·00	5	5·[illegible]	2·[illegible]	"	N	5	N		G	3·80	4·03	4·03	3·85
	"	"	-·00	5	"	"	"	N	5	N	6	P	3·51	3·95	3·95	3·95
	"	"	-·00	5	"	"	"	N	10	N	10	G	3·90	4·03	4·00	4·03
z	Range.	·10	..	·[illegible]	·30	·30	..	..	..	..	..	.	·61	·43	·37	·47
v	Means of M.	6·12	..	5·[illegible]	6·15	2·[illegible]	..			N 3		..	4·09	4·16	4·17	4·12
v′			Parabolic, (v′)		..	..		..	..	..	..	..	4·10	4·15	4·16	4·11
Δ			Discrepancies, (v − v′)		..	..		..	..	..	..	..	−·01	+·01	+·01	+·01

TABLE XIII.

CITIES PAST A VERTICAL

CENTRAL VERTICAL

and 1" tin Tube-Rods]

6								7	8			9	
VELOCITIES tral vertical (mean of three observations)							Rod velocity	DISCHARGE past the vertical	MEAN VELOCITY past the vertical — Various Approximations.			DIFFERENCES	
Depths (z)									Discharge / Depth	Mid-depth Velocity	Rod Velocity Mean of 6 trials		
4	5	6	7	8	9	10	v_R	D	U	$v_{\frac{1}{2}H}$	m	$(v_{\frac{1}{2}H} - U)$	$(m - U)$
3·92	3·90	3·87	3·77	..	..	..	3·77	27·4	3·97	3·96	3·88	− ·01	− ·09
3·92	3·87	3·85	3·53	..	..	..	3·53	27·2	3·93	3·96	3·76	+ ·03	− ·17
3·73	3·90	3·75	3·61	..	..	..	3·61	27·1	3·92	3·88	3·75	− ·04	− ·17
3·73	3·73	3·82	3·61	..	..	..	3·61	27·1	3·93	3·96	3·82	+ ·03	− ·11
3·82	3·92	3·75	3·68	..	.	..	3·68	27·0	3·92	3·94	3·82	+ ·02	− ·10
3·95	3·85	3·68	3·57	.	.	..	3·57	26·9	3·87	3·98	3·74	+ ·11	− ·13
4·00	3·75	3·75	3·75	..	..	..	3·75	27·3	3·98	4·05	3·68	+ ·07	− ·30
4·05	3·75	3·85	?		..	..	3·94	27·8	4·01	4·08	3·97	+ ·07	− ·04
3·87	4·17	3·82	?	.	..	..	3·52	27·8	4·06	3·94	3·85	− ·12	− ·21
3·80	3·85	3·66	?	.	..	..	3·54	26·9	3·90	3·95	3·75	+ ·05	− ·15
3·87	3·90	3·70	3·53	..	..	..	3·53	25·9	3·90	3·98	3·81	+ ·08	− ·09
3·97	3·87	3·75	3·66	..	..	..	3·66	26·1	3·93	4·07	3·79	+ ·14	− ·14
3·90	3·73	3·66	3·61	..	..	..	3·61	25·1	3·79	3·88	3·73	+ ·09	− ·06
3·66	3·59	3·61	3·57	..	..	..	3·57	25·0	3·77	3·80	3·5	+ ·03	− ·20
3·87	3·90	3·59	3·51	..	..	..	3·51	25·4	3·83	3·87	3·66	+ ·04	− ·17
3·73	3·82	3·55	3·43	..	..	..	3·45	25·1	3·79	3·83	3·69	+ ·04	− ·10
39	58	32	? 34	..	..	..	51	2·8	29	28	40	26	26
3·86	3·84	3·72	?3·60	..	..	..	3·61	26·5	3·91	3·95	3·77	+ ·04	− ·14
3·95	3·82	3·65	3·47	..	..	..	3·47	26·3	3·89	3·99	..	+ ·10	..
− ·09	+ ·02	+ ·08	+ ·13	..	..	..	+ ·14	+ 2	+ ·02	− ·04	..	− ·06	..
3·97	3·92	3·77	..	..	..	..	3·73	25·0	4·10	4·22	3·81	+ ·12	− ·29
4·11	3·87	3·77	..	..	..	..	3·74	25·0	4·00	3·94	3·73	− ·06	− ·27
4·00	3·87	3·77	..	..	..	..	3·74	25·9	4·15	4·28	3·77	+ ·13	− ·35
4·05	3·87	3·73	..	..	..	..	3·68	25·6	4·10	4·18	3·76	+ ·08	− ·34
4·17	3·97	3·90	..	..	..	..	3·85	26·0	4·16	4·27	3·81	+ ·11	− ·35
4·05	4·03	3·85	..	..	..	..	3·80	25·8	4·13	4·24	3·8	+ ·11	− ·26
3·97	3·59	3·73	..	..	..	..	3·75	23·6	3·83	3·86	3·59	+ ·03	− ·24
4·00	3·68	4·00	..	..	..	..	4·05	23·9	3·88	3·95	3·76	+ ·07	− ·12
3·68	3·66	3·59	..	..	..	..	3·58	23·6	3·88	4·00	3·80	+ ·12	− ·08
49	44	41	..	..	..	..	4	2·4	·33	·42	2·8	19	·30
4·00	3·83	3·79	..	..	..	..	3·77	25·6	4·03	4·10	3·7	+ ·07	− ·20
4·02	3·89	3·70	..	.	..	..	3·65	25·1	4·03	4·11	..	+ ·08	..
− ·02	− ·06	+ ·09	..	..	..	..	+ ·12	− ·1	00	− ·01	..	− ·01	..

SUBSURFACE AND MEAN VELO-

Solání Right Aqueduct—

[*Instruments*—1⅝" *Double-Floats*,

Serial No.	1 Date, 1876.	2 Depth. Actual. H	2 Depth. Variation.	2 Length of Rod. l	3 Fall of Water-Surface. Upper 5 miles. F_1	3 Fall of Water-Surface. Lower 4½ miles. F_2	3 Fall of Water-Surface. Local Slope. S	4 Wind. From. Direction.	4 Wind. From. Velocity	4 Wind. To. Direction.	4 Wind. To. Velocity.	5 Timekeeper's Initial.	Subsurface past the cen. [Each Velocity is the Nominal 0	1	2	3
Series 16.	26-7-'76	6·00	·00	5	6·30	2·80	250	..	0	..	0	W	4·03	3·97	3·97	3·92
	" "	00	·00	5	"	"	"	..	0	..	0	H	3·85	4·08	4·00	3·95
	" "	·00	·00	5	"	"	"	..	0	..	0	W	3·95	4·03	4·03	3·97
	" "	·00	·00	5	"	"	"	..	0	..	0	H	4·14	4·17	4·11	4·08
	" "	·00	·00	5	"	"	"	..	0	V	1	W	4·14	4·08	4·08	3·85
	" "	·00	·00	5	"	"	"	V	1	..	0	H	4·03	4·11	4·00	4·05
	" "	·00	·00	5	"	"	"	..	0	..	0	W	3·97	4·00	4·11	3·85
	" "	·00	·00	5	"	"	"	..	0	V	1	H	4·03	4·00	4·03	3·97
	" "	·00	·00	5	"	"	"	V	1	V	1	W	3·87	4·08	4·05	4·03
	" "	·00	·00	5	"	"	"	V	1	V	1	H	3·82	4·00	4·00	3·90
	" "	·00	·00	5	"	"	"	V	1	V	1	W	4·08	4·05	4·03	4·00
	" "	·01	+·01	5	6·29	2·81	"	V	10	V	9	H	3·95	4·00	4·11	3·87
	" "	·02	+·01	5	6·28	2·82	"	V	9	S	12	W	3·92	3·97	4·08	3·80
	" "	·03	+·01	5	6·27	2·83	"	S	12	S	12	H	3·92	4·03	4·05	3·70
	" "	·04	+·01	5	6·26	2·84	"	S	12	S	8	W	3·90	4·20	3·97	3·80
	" "	·05	+·01	5	6·25	2·85	"	S	8	S	8	H	4·03	4·17	4·08	3·97
δ	Range.	·05	..	0	·28	·05	000	..	..	..	..	..	·32	·23	·14	·38
v	Means of 16	6·01	..	5	6·37	2·81	250		S 4			..	3·96	4·06	4·05	3·92
v′		Parabolic, (v′)											3·99	4·04	4·03	3·96
Δ		Discrepancies, (v − v′)											−·01	+·02	+·02	−·04
Series 17.	27-7-'76	5·55	·00	5	6·35	3·05	300	S	6	S	7	H	3·70	3·87	3·61	3·70
	" "	55	·00	5	"	"	"	S	7	S	6	W	3·75	3·85	3·77	3·81
	" "	55	·00	5	"	"	"	S	6	S	6	H	3·77	3·93	3·87	3·75
δ	Range.	·00	..	0	·00	·00	000	..	..	..	..	..	·07	·07	·26	·12
v	Means of 3	5·55	..	5	6·35	3·05	300		S 6			..	3·74	3·88	3·75	3·76
v′		Parabolic, (v′)											3·76	3·82	3·81	3·73
Δ		Discrepancies, (v − v′)											−·02	+·06	−·06	+·03

TABLE XIV.

CITIES PAST A VERTICAL.

CENTRAL VERTICAL.

and 1″ tin Tube-Rods]

6								7	8			9	
VELOCITIES tral vertical. mean of three observations]							Bed velocity	DISCHARGE past the vertical	MEAN VELOCITY past the vertical Various Approximations			DIFFERENCES	
Depths (z)									Discharge / Depth	Mid-depth Velocity	Rod Velocity Mean of 6 trials		
4	5	6	7	8	9	10	v_H	D	U	$v_{\frac{1}{2}H}$	v	$(v_{\frac{1}{2}H} - U)$.	$(v - U)$.
3 85	3 68		..	..	..	..	3 51	23 2	3 86	3 92	3 80	+ 06	− 06
3 87	3 61		..	..	..	..	3 35	23·1	3 85	3 95	3 86	+ 10	+ 01
4·00	3 70		..	..	..	..	3 40	23 5	3 91	3 97	3 85	+ 06	− 06
3 82	3 68		..	..	..	..	3 54	23 7	3 95	4 08	3·79	+ 13	−·16
3 80	3 75		..	..	..	..	3 70	23 5	3 92	3 85	3 81	− 07	− 11
3 85	3 64		..	..	..	..	3 43	23·4	3 90	4·05	3 81	+ 15	− 09
3 73	3 61		..	..	..	..	3 49	23 0	3 84	3·85	3 76	+ 01	− 05
3 80	3 85		..	..	..	..	3 90	23 6	3 94	3 97	3 82	+ 03	− 12
3 75	3·61		..	..	..	..	3 47	23 9	3 87	4 03	3 7[illegible]	+ 16	− 12
3 73	3 66		..	..	..	..	3 59	23 6	3 83	3 90	3·88	+ 07	+ 05
3 82	3 70		..	..	..	..	3 56	23 4	3·91	4·00	3·81	+ 09	−·10
3 92	3 73		..	..	..	..	3 54	23·4	3·90	3 87	3 79	− 03	− 11
3 73	3 68		..	..	..	..	3 63	23 1	3 84	3·80	3·8[illegible]	− 04	+ 01
3 80	3 70		..	..	..	..	3·60	23·2	3 84	3 [illegible]0	3 85	− 14	+ 01
3 75	3 70		..	..	..	..	3 65	23·4	3·87	3·80	3 8[illegible]	−·07	00
3 90	3 70		..	..	..	..	3 49	23 8	3 93	3·97	3·8[illegible]	+ 04	− 06
27	24	..	..	..	..	..	·50	8	12	38	·13	30	·21
3 82	3·69	..	..	..	..	..	3·55	23·0	3·89	3·92	3·82	+ 03	−·07
3 83	3 65	..	..	..	..	..	3 40	23 3	3 87	3 96	..	+ 09	..
− 01	+ 04	..	..	..	..	..	+ 16	·0	+ 02	− 04	..	−·06	..
3 61	3 33	..	..	..	..	..	3 18	20·1	3·62	3 68	3 57	+ 06	− 05
3 59	3 41	..	..	..	..	..	3 31	20 0	3·69	3 81	3 58	+ 12	− 11
3 47	3 37	..	..	..	..	..	3 31	20·4	3·63	3·78	3 64	+ 10	− 04
·14	08	..	..	..	..	..	13	·4	07	·13	07	·06	·0
3 56	3·37	..	..	..	..	..	3·27	20·0	3·66	3 76	3·60	+ 10	− 06
3 58	3 35	..	..	..	..	..	3 19	20·3	3·66	3 76	..	+ 10	..
− 02	+ ·02	..	..	..	..	..	+ ·05	·0	·00	·00	..	·00	..

SUBSURFACE AND MEAN VELO

SOLANI RIGHT AQUEDUCT, [LEFT

[*Instruments*—1⅝" *Double-Floats*,

Serial No.	Date 1876	2 DEPTH Actual H	Variation	Length of Rod. l	3 FALL of Water-Surface. Upper 5 miles F_1	Lower 4½ miles F_2	Local Slope. s	4 WIND From Direction	From Velocity	To Direction	To Velocity	5 Timekeeper's Initial.
Series 18	19-76	4 58	+ 05	4	6 47	1 58	Not observed.	N	12	NW	5	W
	" "	63	+ 05	4	6 42	1·63		NW	8	NW	6	H
	" "	68	+ 05	4	6 37	1 68		NW	6	NW	6	W
	" "	73	+ 05	4	6 32	1 73		..	0	N	6	H
d Range,		15	.	0	15	15	..	..	.	..		
v Means of 4		4·66		4	6 40	1 66	..	NW & N 6				.
v		Parabolic, (v)			..	..		..	..	..	..	.
Δ		*Discrepancies, (v—v')*			..	..		..	..	..	..	..
Series 19	19 76	4·04	+ 12	3	6·56	1 04	Not observed	SW	11	..	6	W
	" "	15	+ 10	3	6·45	1 15		..	0	..	6	H
	" "	20	00	3	6 40	1 20		..	0	.	6	W
	" "	20	00	3	.	"		..	0	SW	6	H
	" "	22	+ ·03	3	6·38	1 22		SW	6	SW	6	W
	" "	28	+ 05	3	6 32	1 28		..	0	..	6	H
	" "	·30	00	3	6 30	1 30		..	0	..	6	W
	" "	·30	·00	3	"	"		..	0	..	6	H
d Range,		26	..	0	26	26	..	..	..	..	.	..
v Means of 8,		4 21	..	3	6 52	1 21	..	SW 2				..
v		Parabolic, (v')			..	..		..	..	..	..	..
Δ		Discrepancies, (v — v')			..	..		..	..	..	..	..
Series 20.	19-76	3·94	+ 02	3	6·60	94	Not observed.	N	8	N	4	W
	" "	96	00	3	6·60	95		N	4	N	4	H
	" "	96	·00	3	"	"		N	4	..	6	W
	" "	96	·00	3	"	"		..	0	..	6	H
	" "	97	+ ·03	3	6 63	97		..	0	SSE	7	W
	" "	98	00	3	6·62	98		SSE	7	SW	11	H
	" "	98	00	3	"	"		SW	11	SW	11	W
	" "	98	·00	3	"	"		SW	10	SW	11	H
	" "	4·04	+ 12	3	6·56	1·04		SW	11	.	6	W
	" "	15	+ 10	3	6·45	1 15		..	0	..	6	H
d Range,		21	..	0	21	21	..	..	..	..	.	..
v Means of 10		3·99	.	3	6·61	99	..	SW 3				..
v		Parabolic, (v)						..	..	..	..	..
Δ		Discrepancies (v—v')								..		.

CITIES PAST A VERTICAL. TABLE XV.

AQUEDUCT CLOSED]—CENTRAL VERTICAL.

and 1" tin Tube-Rods.

6						7	8			9	
SUBSURFACE VELOCITIES past the central vertical. (Each Velocity is the mean of three observations).					Rod velocity.	DISCHARGE past the vertical.	MEAN VELOCITY past the vertical. Various Approximations			DIFFERENCES	
Nominal Depths (s)							Discharge / Depth	Mid-depth velocity.	Rod Velocity (Mean of 6 trials)		
0	1	2	3	4	v_R	D	U	$v_{\frac{1}{2}R}$	u	$(v_{\frac{1}{2}R} - U)$.	$(u - U)$.
6 59	6 45	6 38	6 25	6·06	5 95	28·9	6 31	6 34	6 38	+ 03	+ 07
5 88	6 52	6 52	6 38	6 25	6 1,	29 5	6 37	6 48	6 18	+ 11	−·19
6·18	6 45	6·38	6·52	6 12	5 8[illegible]	29 7	6·35	6 43	6 35	+ 08	00
7 06	6·67	6 45	6·45	6 52	6·57	31 1	6·58	6·45	6·38	−·13	− 20
1 18	22	14	27	46	72	2 2	27	·14	·20	24	·27
6 43	6 52	6 43	6 40	6 24	6 14	29 8	6 40	6 43	6 32	+·03	− 08
6 44	6 49	6 47	6 39	6 24	6 10	29 8	6 39	6 45	..	+ 06	..
− 01	+ 03	− 04	+ 01	00	+ 04	0	+ 01	− 02	..	− 03	..
5 71	5 82	5 41	5 61	Not observed	5 82	22 8	5 65	5 41	5 53	− 24	− 12
6 25	5 94	5 77	5 66		5 53	24 1	5 80	5 76	5 61	− 04	− 19
5 66	5 88	5 82	5 61		5 56	24 0	5 71	5 80	5 77	+ 09	+ 06
6 12	5 88	6 12	5 88		5 59	24 3	5 93	6 10	5·88	+ 17	− 05
6 00	6 00	5 82	5 61		5 35	24 3	5 77	5 80	5·82	+ 03	+·05
6 38	5 88	6 00	6 00		6·00	25 1	6 00	6 00	6·03	00	+ 03
6 12	6·12	5 88	5 77		5 63	25 4	5·90	5 86	6 00	− 04	+ 10
6 18	6·18	6·12	5 88		5 57	25 8	6 00	6 08	5 91	+ 08	− 09
72	36	71	39	..	65	3 0	35	69	50	41	29
6·05	5 96	5 87	5 75	..	5·61	24 6	5 85	5 85	5 82	·00	−·03
6 05	5 96	5 87	5 75	..	5 60	24 6	5 84	5 85	..	+ 01	..
00	00	00	00	..	+ 01	0	+ 01	00	..	− 01	..
5 31	5 66	5 50	5 17	..	4 8[illegible]	21 [illegible]	5 38	5 50	5 48	+ 12	+·10
5 82	5 56	5 17	5 22	..	5 2,	21 [illegible]	5 37	5 18	5 33	− 19	− 04
5 31	5 36	5 46	5 13	..	4 8[illegible]	20 [illegible]	5 27	5 46	5 41	+ 19	+ 14
5 66	5 66	5 41	5 17	..	4 94	21 [illegible]	5 40	5 41	5 35	+ 01	− 02
5 41	5 50	5 46	5 26	..	5·0	21 [illegible]	5 [illegible]8	5 46	5 48	+ 08	+ 10
5 94	5·61	5 71	5 26	..	4·8[illegible]	21	5 50	5 71	5 56	+ 21	+ 06
5 71	5 66	5 41	5 26	..	5 [illegible]1	21 7	5 44	5·41	5 50	− 03	+ 06
5 41	5 77	5 66	5 26	.	4·8[illegible]	21·8	5 48	5 66	5 69	+ 15	+ 21
5 71	5 82	5 41	5 61	..	5·8[illegible]	22 8	5 65	5 41	5 53	− 24	− 12
6 25	5 94	5 77	5·66	.	5 5[illegible]	24 1	5 80	5 76	5 61	− 04	− 19
94	58	60	53	..	1 00	3 3	·53	58	30	45	40
5 65	5 65	5·50	5·30	..	5 11	21 8	5 47	5·50	5·50	+ 03	+·03
5 65	5 64	5 51	5 29	..	4 96	21 8	5 45	5·52	..	+·07	..
00	+ 01	− 01	+ 01	..	+ 13	0	+ 02	−·02	..	− 04	..

SUBSURFACE AND MEAN VELO-

Solání Embankment Main Site—

[*Instruments*—1⅝" *Double-Floats*,

Serial No.	1	2				3				4				5			
	Date, 1876-77-78.	Depth.			Length of Rod	Fall of Water-Surface				Wind.				Timekeeper's Initial	Sub-past [Each Nomi-		
		Above Datum	Actual.	Variation.		Upper 4 miles	1 mile below Site	Lower 4½ miles.	Local Slope.	From		To					
										Direction	Velocity	Direction	Velocity				
		A	H		l	F_1	F_2	F_3	S						0	1	2
Series 21.	30-12-'76	0·82	11·00	+ ·01	9½	4·76	1·17	5·50	?	SW	5	SW	9	W	4·32	4·48	4·38
	" "	·81	·02	+ ·03	9½	4·74	"	5·52	?	SW	9	W	12	P	4·35	4·51	4·48
	3-1-'77	·81	10·99	·00	9	4·77	1·18	5·45	21[illegible]	NE	[illegible]	E		P	4·65	4·48	4·38
	" "	·81	·99	·00	9	"	"	"	"	E	9	E	[illegible]	W	4·22	4·29	4·44
	" "	·81	·99	·00	9	"	"	"	"	E	8	E	10	P	4·11	4·32	4·17
	" "	·81	·99	·00	9	"	"	"	"	E	10	E	14	W	4·29	4·51	4·55
	2-1-	·70	·88	·00	9	4·78	1·17	5·40	19[illegible]	..	0	..	[illegible]	W	4·33	4·55	4·55
	" "	·70	·88	·00	9	"	"	"	"	..	0	..	[illegible]	P	4·61	4·72	4·55
	" "	·70	·88	·00	9	"	"	"	"	.	0	.	[illegible]	W	4·44	4·48	4·55
	" "	·71	·89	+ ·02	9	4·77	"	5·41	"	S	7	SE	[illegible]	P	4·17	4·48	4·55
	5-1-	·73	·91	+ ·02	9	4·75	"	5·43	"	SE	5	SW	[illegible]	W	4·35	4·72	4·41
	" "	·56	·74	+ ·02	9	4·77	1·23	5·30	?	NE	10	NE	[illegible]	P	4·41	4·48	4·29
	" "	·57	·76	·00	9	4·76	1·24	"	?	NE	10	NE	[illegible]	W	4·61	4·48	4·20
	" "	·57	·75	·00	9	"	"	"	?	NE	5	E	[illegible]	P	4·38	4·48	4·35
	" "	·57	·75	·00	9	"	"	"	?	E	12	E	[illegible]	W	4·44	4·51	4·65
	" "	·57	·75	·00	9	"	"	"	?	E	4	E	[illegible]	P	4·61	4·35	4·55
δ	Range,	28	28	..	5	04	07	22	?	..	..	..	..	..	54	43	48
v	Means of 14,	9·71	10·89	..	9·00	4·77	1·19	5·39	?	E 4				..	4·39	4·49	4·46
v'		Parabolic, (v')			..	..	..	..	..	..	..	..	..	..	4·46	4·44	4·42
Δ		Discrepancies, (v − v')			..	..	..	..	..	..	..	..	..	..	− ·05	+ ·05	+ ·02
Series 22.	2-2-'77	6·80	8·03	·00	7	4·57	1·36	3·37	23[illegible]	..	0	..	[illegible]	P	3·45	3·70	3·82
	" "	·87	·01	+ ·02	7	4·56	"	3·38	"	..	0	..	[illegible]	W	3·41	3·77	3·75
	" "	·87	·01	− ·01	7	"	"	"	"	..	0	..	[illegible]	P	3·53	3·47	3·43
	" "	·88	·03	+ ·03	7	4·55	"	3·39	"	..	0	SW	[illegible]	W	3·57	3·61	3·73
	" "	8·[illegible]	·06	− ·01	7	4·54	"	3·40	"	SW	9	SW	17	P	3·61	3·66	3·64
	9-1-'78	8·[illegible]	7·99	− ·04	7[illegible]	4·61	1·44	2·95	?	S	3	S	7	P	3·57	3·64	3·85
	" "	·80	·[illegible]	− ·01	7[illegible]	4·63	1·[illegible]	2·85	?	S	7	S	[illegible]	P	3·41	3·57	3·55
	4-1-	·74	·91	+ ·16	7	4·80	1·30	3·11	?	E	5	E & S	[illegible]	G	3·39	3·59	3·61
	17-12-'77	·74	·91	·00	7	4·59	1·41	2·63	?	E & S	5	SE	7	P	3·39	3·70	3·81
	" "	·74	·91	·00	7	"	"	"	?	SE	7	SE	1[illegible]	G	3·55	3·77	3·80
	15-12-'77	·73	·89	− ·01	7	4·61	1·39	2·89	?	W	5	S	[illegible]	G	3·53	3·47	3·73
	4-1-'78	·66	·83	·00	7	4·57	1·38	2·95	?	E	10	E	[illegible]	P	3·37	3·[illegible]	3·55
	3-1-	·64	·81	− ·01	7	4·64	1·36	2·95	?	E	4	E	11	G	3·34	3·61	3·55
	23-12-'77	·64	·81	·00	7	4·64	1·36	2·95	21	NW	6	..	[illegible]	P	3·35	3·53	3·39
	" "	·64	·81	·00	7	"	"	"	"	..	0	S	7	G	3·66	3·53	3·51
	" "	·64	·81	·00	7	"	"	"	"	E	7	S	1[illegible]	P	3·59	3·64	3·55
δ	Range,	23	23	..	5	43	22	·75	?	..	..	..	..	..	31	30	46
v	Means of 14,	6·76	7·9[illegible]	..	7·1	4·61	1·35	3·0[illegible]	?	SSE 4				..	3·45	3·6[illegible]	3·61
v'		Parabolic, (v')			..	..	..	..	..	..	..	..	..	..	3·51	3·58	3·61
Δ		Discrepancies, (v − v')			..	..	..	..	..	..	..	..	..	..	− ·03	+ ·04	+ ·03

CITIES PAST A VERTICAL — TABLE XVI

CENTRAL VERTICAL

and 1″ tin Tube-Rods]

6									7	8			9	
SURFACE VELOCITIES the central vertical								Bed velocity	Discharge past the vertical	MEAN VELOCITY past the vertical — Various Approximations			DIFFERENCES	
Velocity is the mean of three observations]										Discharge / Depth	Mid-depth Velocity	Rod Velocity Mean of 6 trials		
nal Depths (s)														
3	4	5	6	7	8	9	10	v_H	D	U	$v_{\frac{1}{2}H}$	u	$(v_{\frac{1}{2}H} - U)$	$(u - U)$
4 08	4 26	4 22	4 05	4 05	4 17	4 26	4 08	3 90	46 2	4 20	4 13	3 90	− 07	− 30
4 55	4 61	4 05	4 32	4 22	4 20	3 92	4 11	4 30	47 2	4 28	4 19	3 98	− 09	− 33
4 48	4 41	4 29	4 48	4 51	4 48	4 14	4 11	4 08	48 0	4 37	4 39	3 95	+ 02	− 42
4 38	4 11	4 29	4 29	4 08	4 05	3 95	3 92	3 89	45 8	4 17	4 29	3 93	+ 12	− 24
4 11	4 22	4 05	4 08	4 20	4 00	3 80	4 08	4 06	45 4	4 13	4 0[illegible]	3 93	− 06	− 20
4 20	4 44	4 26	3 95	3 92	3 95	4 05	3 92	3 81	45 7	4 16	4 10	4 04	− 06	− 12
4 55	4 44	4 29	4 41	4 41	4 17	4 00	4 20	4 38	47 4	4 36	4 34	3 9[illegible]	− 02	− 39
4 42	4 80	4 51	4 41	4 41	4 20	4 20	4 26	4 31	48 4	4 45	4 47	4 15	+ 02	− 30
4 51	4 51	4 32	4 26	4 32	4 17	4 03	3 97	3 92	46 8	4 30	4 29	4 10	− 01	− 20
4 58	4 51	4 26	4 55	4 48	4 08	4 03	4 11	4 15	47 4	4 35	4 39	4 10	+ 04	− 25
4 26	4 61	4 44	4 44	4 32	4 32	4 32	4 17	4 03	47 8	4 38	4 44	4 3	+ 06	− 05
4 29	4 20	4 20	4 11	4 17	4 29	3 90	3 95	3 99	45 0	4 19	4 17	3 83	− 02	− 36
4 58	4 22	4 05	3 90	3 80	4 17	3 92	4 17	4 36	44 9	4 18	3 99	3 90	− 19	− 28
4 35	4 55	4 38	4 22	4 22	4 29	4 14	4 05	3 98	46 2	4 30	4 32	3 68	+ 02	− 62
4 48	4 38	4 14	4 02	3 77	4 00	4 11	3 85	3 65	45 3	4 21	4 21	3 8[illegible]	00	− 34
4 41	4 35	4 48	4 11	4 14	4 29	4 29	4 17	4 08	46 0	4 32	4 34	3 90	+ 02	− 36
50	69	46	65	74	53	52	41	73	3 5	32	48	65	·31	57
4 39	4 43	4 26	4 24	4 19	4 18	4 07	4 07	4 08	46 5	4 27	4 26	3 9[illegible]	− 01	− ·30
4 40	4 37	4 33	4 28	4 22	4 15	4 07	3 98	3 89	46 4	4 26	4 31	..	+ 05	..
− 01	+ ·06	− 07	− 04	− 03	+ 03	00	+ 09	+ 19	+ 1	+ 01	− 05	..	− 06	..
3 87	3 55	3 31	3 39	3 14	?	..	..	2 88	28 1	3 50	3 55	3 33	+ 05	− 17
3 57	3 5[illegible]	3 53	3 33	3 35	?	..	..	3 3	28 4	3 53	3 57	3 34	+ 04	− 19
3 41	3 5[illegible]	3 16	3 28	3 43	?	..	..	3 59	27	3 39	3 56	3 2	+ 17	− 16
3 53	3 49	3 41	3 33	3 21	?	..	..	3 [illegible]	27 [illegible]	3 44	3 49	3 2[illegible]	+ 05	− 18
3 53	3 3[illegible]	3 39	3 24	3 21	?	..	..	3 18	27	3 44	3 37	3 21	− 07	− 23
3 68	3 3	3 61	3 28	3 26	3 47	..	..	3 4[illegible]	-8 2	3 53	3 35	3 31	− 18	− 2
3 75	3 55	3 68	3 41	3 33	3 3[illegible]	..	..	3 3	28[illegible]	3 55	3 55	3 26	00	− 2[illegible]
3 59	3 55	3 51	3 4	3 35	3 35	..	..	3 3	27 [illegible]	3 51	3 55	3 28	+ 04	− 2[illegible]
3 45	3 77	3 45	3 21	3 28	3 16	..	..	3 16	27 [illegible]	3 48	3 [illegible]6	3 1[illegible]	+ 28	− 29
3 59	3 55	3 49	3 35	3 23	3 17	..	..	3 1[illegible]	27 8	3 52	3 55	3 20	+ ·03	− 26
3 33	3 55	3 19	3 25	3 14	3 31	..	..	3 31	-6 4	3 35	3 54	3 3[illegible]	+ 19	− 0
3 73	3 68	3 43	3 41	3 22	3 23	..	..	3 2[illegible]	27 4	3 50	3 68	3 34	+ 18	− 16
3 51	3 57	3 30	3 35	3 30	3 26	..	..	3 26	-6 [illegible]	3 44	3 56	3 3[illegible]	+ 12	− 09
3 47	3 68	3 49	3 28	3 28	3 24	..	..	3 24	26 [illegible]	3 43	3 66	3 41	+ 23	− 0
3 61	3 5[illegible]	3 28	3 41	3 26	3 31	..	..	3 31	26 [illegible]	3 44	3 52	3 2	+ 08	− ·17
3 5[illegible]	3 5[illegible]	3 4[illegible]	3 39	3 22	3 14	..	..	3 14	-7 [illegible]	3 4[illegible]	3 52	3 24	+ ·05	− 2[illegible]
54	42	32	26	29	? ·33	..	..	71	2 [illegible]	20	41	27	46	27
3 57	3 5[illegible]	3 42	3 31	3 26	? 3·27	..	..	3 26	27[illegible]	3 47	3 [illegible]5	3 2[illegible]	+ ·03	− 1[illegible]
3 60	3 55	3 47	3 34	3 18	2 98	..	..	2 9	27 4	3 45	3 56	..	+ 11	..
− 03	00	− 05	00	+ 08	+? 29	..	..	+ 2[illegible]	+ 1	+ ·02	− ·01	..	− ·03	..

SUBSURFACE AND MEAN VELO-

Solání Embankment Main Site—

[*Instruments*—1⅝" *Double-Floats,*

Serial No.	Date, 1876-77.	1	2 Depth. Above Datum. h	2 Depth. Actual. H	2 Depth. Variation	2 Length of Rod. l	3 Fall of Water-Surface. Upper 4 miles. F_1	3 Fall of Water-Surface. 1 mile below Site. F_2	3 Fall of Water-Surface. Lower 4½ miles. F_3	3 Fall of Water-Surface. Local Slope. s	4 Wind. From Direction.	4 Wind. From Velocity.	4 Wind. To Direction.	4 Wind. To Velocity.	5 Timekeeper's Initial.	Subsurface and Mean Velocity past the Site. [Each Velocity Nominal. 0	1	2
Series 23.	25-10-'76		6·63	7·80	·00	6	5 20	1·15	3 35	Not observed.	..	0	..	0	P	4·08	4·44	4·17
	" "		·63	·80	−·01	6	"	"	"		..	0	..	0	W	4·29	4·32	4·29
	" "		·63	·79	·00	6	5·21	"	3·34		..	0	..	0	P	4·14	4·55	4·26
	" "		·62	·79	·00	6	"	"	"		..	0	..	0	W	4·26	4·38	4·29
	" "		·62	·79	−·01	6	"	"	"		..	0	..	0	P	4·38	4·22	4·58
	" "		·61	·78	−·01	6	5·22	"	3·33		..	0	..	0	W	4·32	4·32	4·20
	" "		·61	·78	+·01	6	"	"	"		..	0	..	0	P	4·29	4·05	4·00
	" "		·61	·78	−·01	6	"	"	"		..	0	..	0	W	4·32	4·55	4·23
	" "		·61	·78	+·01	6	"	"	"		..	0	..	0	P	4·35	4·26	4·17
	" "		·60	·77	−·02	6	5·23	"	3·32		..	0	..	0	W	4·17	4·55	4·32
d	Range.		·03	·03	..	0	·03	·00	·03	..	..	..	..	..	..	·30	·50	·58
v	Means of 10.		6 62	7·79	..	6	5·21	1·15	3 34	..		Calm			..	4·26	4·36	4 25
v'			Parabolic, (*v'*) ..				..	..	..	..	..	..	..	..	..	4 29	4·29	4·26
Δ			*Discrepancies, (v−v')*					..	..	..	..	..	..	..	..	−·03	+ 07	−·01
Series 24.	25-1-'77		6·15	7 23	+ ·01	6	4 63	1·42	2·90	230	W ⅛ N	4	W	10	P	3 33	3·49	3 45
	" "		·17	·33	+ ·03	6	4·61	"	2·92	"	W	10	NW	11	W	3·41	3 61	3·33
	" "		·20	·38	+ ·03	6	4 58	"	2·93	"	NW	10	W	6	P	3 17	3·37	3 41
	" "		·22	·40	+ ·02	6	4 61	"	2·97	"	W	6	SW	12	W	3·45	3·35	3·37
	5-1-"		·26	·44	·00	7	4 67	1·38	2·55	?	SW	6	SW	7	P	3 51	3 31	3 33
	" "		·26	·44	·00	7	"	"	"	?	SW	7	W	21	W	3 43	3 57	3·53
d	Range.		·11	·11	..	·01	·09	·04	·22	?	..	..	..	..	..	·34	·26	·20
v	Means of 6.		6·21	7·39	..	6·67	4·63	1 41	2·81	?		W 8			..	3·39	3·48	3·41
v'			Parabolic, (*v'*) ..				..	..	..	..	..	..	..	..	..	3·42	3·43	3·42
Δ			*Discrepancies, (v−v')*					..	..	..	..	..	..	..	..	−·03	+·05	−·01

TABLE XVII.

CITIES PAST A VERTICAL.

Central Vertical

and 1" tin Tube-Rods]

6									7	8				9	
face Velocities central vertical is the mean of three observations)								Bed velocity	Discharge past the vertical	Mean Velocity past the vertical — Various Approximations.				Differences	
nal Depths (z)										Discharge / Depth	Mid-depth Velocity.	Rod Velocity Mean of 6 trials			
3	4	5	6	7	8	9	10	v_B	D	U	$v_{\frac{1}{2}B}$	u		$(v_{\frac{1}{2}B} - U)$.	$(u - U)$
4 17	3 87	4 05	3 92	Not observed.	..	..	..	3 69	31 9	4 09	3 90	3·8[illegible]		−·19	− 24
4 20	4 08	4 03	3 87		..	..	..	3 58	31 8	4 07	4 09	3 99		+ 02	− 08
4 20	4 20	4 14	3 87		..	..	..	3 39	32 0	4 11	4 20	3 99		+ 09	−·12
4 29	4 22	4 17	3 95		..	..	..	3 56	32 3	4 14	4 23	4 03		+ 09	− 11
4 03	4 14	4 11	3 90		..	..	..	3 52	31 5	4 04	4 13	3 99		+ 09	− 05
4 41	4 14	4 03	3 9[illegible]		..	..	..	3 81	32 4	4·16	4 17	4·05		+·01	− 11
4·08	3 97	3 85	3 77		..	..	..	3 63	30·6	3 93	3 98	3·90		+ 05	− 03
4 29	4 17	4 26	3 87		..	..	..	3 18	32 2	4 14	4 18	4 00		+ 04	− 14
4 08	4 11	4 08	3 70		..	..	..	3·62	30·7	3 95	4 11	3 97		+·16	+ 0[illegible]
3 97	3 95	4 08	3 92		..	..	..	3 64	31 7	4·08	3 95	3 92		− 13	− 16
44	35	41	25	..	..	..	..	79	1 8	23	·33	20		35	·26
4 17	4 09	4 0[illegible]	3 87	..	..	..	..	3 50	31 7	4 07	4 09	4 00		+·02	− 0[illegible]
4 21	4 13	4 02	3 88	..	..	..	..	3 56	31 7	4 07	4 14	..		+·07	..
− 04	− 04	+ 06	− 01	..	..	..	..	− 06	0	00	− 05	..		− 05	..
3 30	3 23	3 17	3 11	2 83	..	..	..	2 74	23·8	3 24	3 25	3 17		+ 01	− 0
3 35	3 26	3 28	3 08	2 93	..	..	..	2 88	24·5	3 31	3 29	3 14		− 02	− 17
3 47	3 23	3 09	2·82	2 90	..	..	..	2 93	23·7	3 21	3 [illegible]0	3 1[illegible]		+ 09	− 08
3 28	3 17	3 03	3 03	2 88	..	..	..	2 82	23·5	3 17	3 20	3 1[illegible]		+ 03	− 04
3 43	3 33	3 24	2·99	2 88	..	..	..	2 8	24·[illegible]	3 29	3 36	3 2		+ 07	− 0
3 45	3 30	3 30	3·06	3·06	..	..	..	3·06	24 [illegible]	3 35	3 34	3·04		− 01	−·31
19	16	27	29	23	..	..	..	3[illegible]	1·4	·18	16	·1[illegible]		11	·2[illegible]
3·38	3 25	3 19	3 02	2 91	..	..	..	2 88	24·1	3 26	3 29	3 14		+ 03	− 12
3 37	3 29	3 18	3·04	2 86	..	..	..	2 78	24 0	3 25	3 32	..		+ 07	..
+ 01	− 04	+ 01	− 02	+ 05	..	..	..	+·10	+ 1	+ 01	−·03	..		− 04	..

SUBSURFACE AND MEAN VELO-

Solání Embankment Main Site—

[*Instruments*—1⅝" *Double-Floats,*

Serial No	1	2				3				4				5			
	Date, 1876.	Depth			Length of Rod.	Fall of Water-Surface.				Wind				Timekeeper's Initial	Subsur past the		
		Above Datum	Actual	Variation.		Upper 4 miles.	1 mile below S Le	Lower 4½ miles	Local Slope	From		To			Each Velocity		
										Direction.	Velocity	Direction	Velocity		Nomi		
		h	H		*l*	F_1	F_2	F_3	S						0	1	2
Series 25.	23 10 '76	6 06	7 24	− 03	6	5 17	1 23	3 00	Not observed.	..	0	..	0	W	3 75	3 97	3 95
	" "	06	24	− 01	6	"	"	"		..	0	NE	5	H	4 00	4 11	4 14
	" "	06	24	+ 01	6	"	"	"		NE	5	NE	7	W	3 70	3 82	3 85
	" "	06	24	− 01	6	"	"	"		NE	7	NE	6	H	3 80	3 85	3 80
	" "	05	23	00	6	5 18	"	2 99		NE	6	NE	8	W	3 75	4 03	3 90
	" "	05	23	− 01	6	"	"	"		NE	8	NE	10	H	3 87	4 05	3 95
	" "	04	22	00	6	5 19	"	2 98		NE	10	NE	10	W	3 95	3 68	3 77
	" "	04	22	00	6	"	"	"		NE	10	ENE	12	H	3 75	3 61	3 66
	" "	12	30	+ 01	6	5 31	1 24	3 05		SW	4	W	7	W	3 90	4 03	3 95
	" "	13	31	+ 01	6	5 30	"	3 06		W	7	NW	5	H	3 97	4 11	4 14
	" "	14	32	+ 01	6	5 29	"	3 07		NW	5	NW	4	W	4 14	3 97	3 95
	" "	15	33	+ 02	6	5 28	"	3 08		NW	4	NW	4	H	3 95	3 95	3 95
δ	Range	11	11	..	0	14	01	10	..	..	..	..	..	..	44	50	48
v	Means of 12	6 08	7 26	..	6	5 22	1 23	3 02	..		NNE 4			..	3 88	3 94	3 92
v'		Parabolic, (v)				..	..	..		..	..	..	..	..	3 89	3 92	3 91
Δ		Discrepancies, (v − v')				..	..	..		..	..	..	..	..	− 01	+ 02	+ 01
Series 26	13 10 '76	5 29	6 47	+ 01	5	4 89	91	1 35	Not observed	SW	7	SW	12	H	2 97	3 16	2 97
	" "	30	48	+ 01	5	4 88	"	1 36		SW	12	SE	6	W	2 82	3 03	2 97
	" "	31	49	+ 01	5	4 87	"	1 37		SE	6	SSW	12	H	2 99	2 90	3 05
	" "	32	50	+ 01	5	4 86	"	1 38		SW	12	S	6	W	2 90	3 06	3 00
	" "	33	51	+ 01	5	4 85	"	1 39		S	5	SE	14	H	2 82	3 11	2 93
	" "	34	52	+ 02	5	4 84	"	1 40		SE	14	S	6	W	2 97	3 09	3 05
	" "	35	53	00	5	4 83	"	1 41		S	8	S	6	H	2 91	3 08	3 08
δ	Range	06	06	..	0	06	00	06	..	..	..	..	..	..	17	26	15
v	Means of 7	5 32	6 50	..	5	4 86	91	1 38	..		S 7			..	2 91	3 06	3 01
v'		Parabolic, (v)				..	..	..		..	..	..	..	..	2 94	3 01	3 01
Δ		Discrepancies, (v − v)				..	..	..		..	..	..	..	..	− 03	+ 05	00

TABLE XVIII.

CITIES PAST A VERTICAL.

CENTRAL VERTICAL.

and 1″ tin Tube-Rods].

6									7	8				9	
FACE VELOCITIES central vertical.								Bed velocity.	DISCHARGE past the vertical.	MEAN VELOCITY past the vertical. Various Approximations				DIFFERENCES	
is the mean of three observations.]										Discharge / Depth.	Mid-depth Velocity.	Rod Velocity Mean of 6 trials			
nal Depths (*t*)															
3	4	5	6	7	8	9	10	v_B	D	U	$v_{\frac{1}{2}B}$	*u*		$(v_{\frac{1}{2}B} - U)$.	$(u - U)$
3 73	3 70	3 45	3 53	Not observed.	..	..	..	3 63	26 8	3 70	3 71	3 53		+·01	−·17
3 82	3 59	3 87	3 47		..	..	..	3 9	27 4	3 78	3 68	3 75		−·10	− 03
3 64	3 70	3 73	3 45		..	..	..	3 10	26 4	3 64	3 68	3 60		+·04	− 04
3 97	3 95	3 68	3 49		..	..	..	3 2	27 1	3 75	3 96	3 5		+ 21	− 18
3 87	3 66	3 68	3 59		..	..	..	3 48	27 4	3 78	3 74	3 6		− 04	−·15
3 66	3 55	3 57	3 57		..	..	..	3 5	26	3 72	3 59	3 46		−·13	−·20
3 87	3 77	3 37	3 53		..	..	..	3 73	26 8	3 67	3 81	3 42		+·14	− 25
3 70	3 61	3 49	3 37		..	..	..	3 22	25 7	3 55	3 65	3 32		+ 10	−·23
3 95	3 97	3 64	3 57		..	..	..	3 48	27	3 82	3 96	3 51		+·14	− 31
3 95	3 95	3 85	3 57		..	..	..	3 20	28	3 85	3 95	3 52		+·10	− 33
4·00	3 92	3 85	3 64		..	..	..	3 26	28	3 86	3 95	3 55		+ 09	−·31
3 92	4·08	3 90	3 55		..	..	..	3 08	27	3 81	4 03	3 4		+·22	− 32
36	53	·53	27	..	..	..	..	·70	2 6	31	·44	·4		·35	30
3 84	3·79	3 67	3 53	..	..	..	..	3 34	27	3 74	3 81	3·53		+·07	− 21
3 97	3 79	3 67	3 52	..	..	..	..	3 27	27 2	3 74	3 82	..		+ 08	..
− 03	00	00	+ 01	..	..	..	..	+ 07	0	00	− 01	..		− 01	..
2 91	2 80	2 68	Not observed.	..	..	..	..	2 50	18 5	2 86	2 88	2·82		+ 02	−·04
3 01	2 75	2 79		..	..	..	..	2 85	18 7	2 89	2·95	2·88		+ 06	− 01
2 80	2 84	2 80		..	..	..	..	2 74	18 6	2 87	2·81	2·83		− 06	− 04
2 90	2 91	2 54		..	..	..	..	1·98	18·0	2 77	2·90	2 86		+·13	+ 09
2 90	2 83	2 63		..	..	..	..	2 33	18 3	2 82	2 95	2 71		+ 13	− 06
2 86	2 70	2 64		..	..	..	..	2 55	18·5	2 83	2 82	2 78		−·01	− 03
2 78	2 93	2 78		..	..	..	..	2 55	18·6	2 88	2 82	2 81		−·06	− 07
·23	23	26	..	..	..	..	..	87	6	·12	·14	12		·19	·16
2 89	2 82	2 69	..	..	..	..	..	2·30	18 5	2 83	2 88	2·8		+·03	−·03
2 95	2 82	2 63	..	..	..	..	..	2 22	18 3	2 81	2 92	..		+ 11	..
− 06	·00	+ 06	..	..	..	..	..	+ 28	+·2	+·04	− 04	..		−·08	..

SUBSURFACE AND MEAN VELO-

Solání Embankment Main Site—

[*Instruments*—1⅝″ *Double-Floats*,

Serial No.	1 Date 18 6.	2 Depth: Above Datum h	Depth: Actual H	Depth: Variation	Length of Rod. l	3 Fall of Water-Surface: Upper 4 miles F_1	Fall: 1 mile below Site F_2	Fall: Lower 4½ miles F_3	Local Slope S	4 Wind: From Direction	From Velocity	To Direction,	To Velocity	5 Timekeeper's Initial	Subsurface past the (Each Velocity Nomi 0	1	2
Series 27.	16 10 '76	5 10	6 28	00	5	4 98	1 12	2 45	Not observed	..	0	..	0	W	3 26	3 30	3 14
	" "	10	28	− 01	5	"	"	"		..	0	..	0	H	3 19	3 33	3 30
	" "	09	27	− 01	5	4 99	"	2 44		..	0	..	0	W	3 19	3 39	3 41
	" "	·08	26	00	5	5 00	"	2 43		..	0	..	0	H	3 35	3 39	3 43
	" "	08	26	− 01	5	"	"	"		..	0	..	0	W	3 31	3 53	3 39
	" "	·07	25	00	5	5 01	"	2 42		..	0	..	0	H	3 37	3 24	3 41
	" "	·07	25	00	5	"	"	"		..	0	..	0	W	3 33	3 21	3 45
	" "	07	25	− 01	5	"	"	"		..	0	..	0	H	3 35	3 49	3 45
	" "	06	24	00	5	5 02	"	2 41		..	0	..	0	W	3 45	3 55	3 39
	" "	06	24	− 01	5	"	"	"		..	0	..	0	H	3 49	3 41	3 33
	" "	05	23	− 01	5	5·03	"	2 40		..	0	..	0	W	3 30	3 31	3 41
	" "	04	22	00	5	5 04	"	2 39		..	0	N	7	H	3 51	3 30	3 41
	" "	·04	22	·00	5	"	"	"		N	7	N b E	5	W	3 31	3 41	3 41
	" "	04	22	− 01	5	"	"	"		N b E	5	N b E	5	H	3 41	3 30	3·09
	" "	03	21	00	5	5 05	"	2 38		N b E	8	N b E	6	W	3 21	3·43	3 37
	" "	03	21	− 01	5	"	"	"		N b E	6	N	8	H	3 33	3 30	3 37
δ	Range,	07	07	..	0	07	00	07	..	..	..	..	..	..	32	34	36
v	Means of 16	5·06	6 24	..	5	5 02	1 12	2 41	..	N 2				..	3·34	3·37	3 36
v′		Parabolic, (v) .				..	..	..		..	..	..	..		3 34	3 37	3 35
Δ		Discrepancies, (v − v′)				..	..	.		..	..	..	..		00	00	+ 01
Series 28.	13 10 '76	5 09	6 27	+ 01	5	4 74	91	1 15	Not observed	..	0	..	0	P	2 78	2 94	2 65
	" "	10	28	+ 01	5	4·73	"	1 16		..	0	..	0	W	3 24	2 86	2 91
	" "	10	28	00	5	,	"	"		..	0	..	0	P	2 80	3 00	2 91
	" "	10	28	00	5	"	"	"		..	0	..	0	W	2 91	2 86	2 86
	" "	10	28	00	5	"	"	"		..	0	..	0	P	2 91	2 88	2 58
	" "	10	28	00	5	"	"	"		..	0	..	0	W	2 79	2 86	2 80
	" "	10	28	00	5	"	"	"		..	0	..	0	P	2 75	2 94	2 56
	" "	10	28	00	5	"	"	"		..	0	W b S	20	W	2 78	2 79	2 84
	12 10- "	4 88	·06	− 01	5	4·65	·90	1 10		ENE	12	ENE		H	2 79	2 78	2 73
	" "	87	·05	00	5	4·66	"	1 09		ENE	9	ENE	8	W	2 88	2 76	2 68
	" "	·87	05	− 01	5	"	"	"		ENE	8	E	10	H	2 67	2 64	2 80
	" "	·87	·05	+ 01	5	"	"	"		E	10	E	13	W	2 99	2 63	2 69
	" "	·87	05	− 01	5	"	"	"		E	13	E	11	H	2 88	2 79	2 75
	" "	86	·04	00	5	4 67	"	1 08		E	11	E	15	W	2 76	2 80	2 72
	" "	86	04	00	5	"	"	"		E	15	E	12	H	2 75	2 78	2 82
	" "	87	·05	+ 01	5	4 66	"	1·09		E	12	E	15	W	2 79	2 79	2 74
δ	Range,	24	24	..	0	09	01	08	..	..	..	..	..	..	57	37	35
v	Means of 16,	4·98	6·16	..	5	4·70	91	1 12	..	E 5				..	2·84	2·82	2 77
v′		Parabolic, (v′) ..				..	..	..		..	..	..	..		2 84	2 82	2 77
Δ		Discrepancies, (v − v′)				..	..	..		..	..	..	..		00	00	00

TABLE XIX.

CITIES PAST A VERTICAL

CENTRAL VERTICAL

and 1″ tin Tube-Rods]

6									7	8			9	
FACE VELOCITIES central vertical is the mean of three observations.] nal Depths (*s*)								Bed-velocity	DISCHARGE past the vertical	MEAN VELOCITY past the vertical Various Approximations Discharge / Depth	Mid-depth Velocity	Rod Velocity (Mean of 3 trials)	DIFFERENCES	
2	4	5	6	7	8	9	10	v_B	D	U	$v_{\frac{1}{2}B}$	u	$(v_{\frac{1}{2}B} - U)_0$	$(u - U)$
3 11	3 14	2 94	Not observed	..	..	..	..	2 68	19 4	3 09	3 11	3 06	+ 02	− 03
3 31	3 30	3 09		..	..	..	..	2 82	20 2	3 21	3 21	2 83	+ 10	− 35
3 19	3 11	3 08		..	..	..	..	3 04	20 1	3 21	3 18	3 18	− 03	− 03
3·35	3 31	3 01		..	..	..	..	2 63	20·2	3·23	3 34	3 08	+ 11	− 15
3 33	3 33	3 09		..	..	..	..	2 ·9	20 7	3 30	3 50	3 2[illegible]	+ 20	− 01
3 11	3 13	3 00		..	..	..	..	2 84	19 7	3 16	3 11	3 07	− 05	− 09
3 35	3 33	2 96		..	..	..	..	2 50	19·9	3 18	3 35	3 12	+ 17	− 06
3 21	3 13	3 16		..	..	..	..	3 20	20 5	3 28	3 20	3 19	− 08	− 09
3 31	3 06	3 13		..	..	..	..	3 22	20 3	3 29	3 28	3 11	− 01	− 18
3 26	3 23	3 00		..	..	..	..	2 7[illegible]	20·0	3 21	3 26	3 [illegible]	+ 05	− 08
3 33	3 05	2 93		..	..	..	..	2 76	19 7	3 17	3 30	3 [illegible]	+ 13	00
3 13	3 09	3·03		..	..	..	..	2 96	19·9	3 19	3 13	3 23	− 06	+ 04
3 33	3 13	3 03		..	..	..	..	2 91	20 1	3 23	3 31	3 11	+ 08	− 12
3 28	3 39	3 01		..	..	..	..	2 55	19 [illegible]	3 16	3 29	3·06	+ 13	−·08
3 24	3 17	2 99		..	..	..	..	2 7	19 6	3 19	3 23	3 14	+ 04	− 05
3 30	3 13	3 24		..	..	..	..	3·3	20 4	3 29	3 28	3 02	− 01	− 2
42	34	31	..	..	..	..	..	87	1 3	21	39	46	28	42
3·27	3 19	3·04	..	..	..	..	..	2 80	20·1	3 21	3 26	3 11	+ 03	− 10
3 29	3 18	3 04	..	..	..	..	..	2 79	20 0	3 21	3 26	..	+ 07	..
− 02	+ 01	00	..	..	..	..	..	+ 07	+·1	00	− 02	..	− 02	..
2 68	2 50	2 46	..	..	..	..	..	2 41	16 [illegible]	2 63	2 65	2 6[illegible]	+ 02	+ 0[illegible]
2 84	2 7[illegible]	2 46	..	..	..	..	..	2 09	17 1	2 73	2·83	2 6	+ 10	− 06
2 65	2 68	2 52	..	..	..	..	..	2 32	17·[illegible]	2 71	2·65	2 63	− 06	− 08
2 6[illegible]	2 68	2 51	..	..	..	..	..	2 2	16 8	2 68	2 65	2 6	− 03	− 01
2 [illegible]8	2 63	2 52	..	..	..	..	..	2 3[illegible]	16 [illegible]	2 70	2 67	2 59	− 03	− 11
2 62	2 83	2 54	..	..	..	..	..	2 1[illegible]	16 8	2 68	2 65	2 72	− 03	+·04
2 75	2 73	2 [illegible]8	..	..	..	..	..	1·9	16 [illegible]	2 60	2·75	2 7	+ 15	+ 1[illegible]
2 87	2 72	2 40	..	..	..	..	..	1 9[illegible]	16 [illegible]	2 65	2 85	2 7[illegible]	+ 20	+ 0[illegible]
2 69	2 53	2 36	..	..	..	..	..	2 18	15 [illegible]	2 59	2 69	2 49	+ 10	− 10
2·53	2 53	2 29	..	..	..	..	..	2 04	15 4	2 54	2 53	2 53	− 01	− 01
2 61	2 37	2 42	..	..	..	..	..	2 4	15 [illegible]	2 57	2 60	2 41	+·03	− 1[illegible]
2 67	2 32	2 37	..	..	..	..	..	2 42	15	2 56	2 66	2 4[illegible]	+ 10	− 08
2 73	2 38	2 33	..	..	..	..	..	2 28	15 7	2 60	2 72	2 6	+ 12	+·0
2 70	2 41	2 36	..	..	..	..	..	2 31	15·[illegible]	2 59	2 69	2 49	+ 10	− 10
2 54	2 56	2 52	..	..	..	..	..	2 4[illegible]	15·[illegible]	2 64	2 54	2 54	− 10	− 10
2 62	2 54	2 35	..	..	..	.	..	2 1[illegible]	15·[illegible]	2 58	2 62	2 41	+·04	− 1[illegible]
34	51	23	..	..	..	..	..	3[illegible]	1 [illegible]	19	32	3[illegible]	30	·29
2 6[illegible]	2·57	2 42	..	..	..	..	..	2·24	16 [illegible]	2 63	2·67	2·5 [illegible]	+ ·04	− ·04
2 65	2 57	2 42	..	..	..	..	..	2 21	16 1	2 62	2 63	..	+ 06	..
00	00	·00	..	..	..	..	..	+ 0	+ 1	+ ·01	− ·01	..	− ·01	..

SUBSURFACE AND MEAN VELO-

Solání Right Aqueduct—

[*Instruments*—$1\frac{6}{8}$″ *Double-Floats,*

N B—The Actual Depth (H) on the vertical of Experiment is 0·5 of a foot

Serial No	1	2			3			4				5				
		Depth			Fall of Water-Surface			Wind.					Subsurface past the sem-			
								From		To			(Each Velocity is the Nominal			
	Date, 1876-77	Actual.	Variation.	Length of Rod	Upper 5 miles	Lower 4½ miles.	Local Slope	Direction	Velocity.	Direction	Velocity	Timekeeper's Initial	0	1	2	3
		H		l	F_1	F_2	S									
Series 29.	21-3-'76	8·48	+ 05	8	5 72	5 03	100	..	0	..	0	H	2 31	2 78	2 59	2 68
	„ „	50	00	8	5 80	5 05	?	..	0	..	0	W	2 31	2 88	2 68	2 83
	20-3- „	·48	00	8	5 77	5·03	?		0	SSW	5	H	2 34	2 54	2 68	2 54
	„ „	·48	00	8	„	„	?	SSW	5	SSW	5	W	2 59	2 78	2 68	2 69
	24-3- „	·47	+ 07	8	5 73	5 02	?	.	0	SSW	14	W	2 34	2 63	2 68	2 54
	22 3- „	·45	·00	8	5 80	5 00	?	..	0	.	0	H	2 27	2 88	2 31	2 88
	„ „	45	00	8	„	„	?	..	0	..	0	W	2 46	2 54	2 68	2 59
	23-3- „	41	+ ·03	8	5 79	4 96	?		0	S	12	H	2 46	2 54	2 54	2 63
	20 3- „	33	+ 05	8	5 77	4 93	?	SW	5	S	10	H	2 31	2 27	2 63	2 68
	„ „	38	+ 05	8	5·87	4 98	?	S	10	..	0	W	2 05	2 73	2 59	2 73
	27-3- „	·30	+ 10	8	5 90	4 95	?	..	0	..	0	W	2 50	2 68	2 27	2 78
	28-3- „	35	00	8	5 85	4 95	?	..	0	N	15	H	2 24	2 50	2 31	2 59
	29 3- „	30	00	8	5 80	4 80	?	.	0	..	0	W	2 03	2 34	2 42	2 42
	„ „	30	00	8	„	„	?	..	0	..	0	H	2 42	2 50	2 63	2 54
	27-3 „	28	+ 05	8	5 82	4 88	?	..	0	..	0	H	2 31	2 42	2 73	2 63
	17-3 „	28	00	8	5 82	4 83	?	..	0	SW	14	W	2 50	2 59	2 83	2 54
δ	Range,	22	..	0	·18	25	?	..	..	..	.	..	54	61	56	46
v	Means of 16,	8 39	..	8	5 80	4 90	?		SSW 2			..	2 34	2 60	2 58	2 64
v		Parabolic, (v′)			..	..	..	..	..	..	..	..	2 39	2 51	2 60	2 66
Δ		Discrepancies (v − v)			..	..	..	..	..	..	..	..	− 05	+ ·09	−·02	− 02
Series 30.	27 3-'77	7·07	− 01	7	5 83	4 02	Not observed	NW	4	V	1	P	2 46	2 61	2 70	2 86
	„ „	·06	00	7	5·84	4·01		V	2	V	1	W	2 42	2 70	2 75	2 75
	26-3- „	6 87	00	7	5 88	3 87		V	1	V	1	W	2 50	2 63	2 68	2 86
	„ „	89	+ 03	7	5 86	3 89		V	1	NE	1	P	2 50	2 86	2 63	2 78
	„ „	·90	·00	7	5 90	3 90		NE	4	NW	4	W	2 24	2 94	2 70	2 80
δ	Range,	20	..	0	07	15	..	..	..	..	.	..	26	33	15	·11
v	Means of 5,	6 96	..	7	5·86	3 94	..		N 1			..	2 42	2 70	2 71	2 81
v		Parabolic, (v′)			..	..	..	..	..	..	.		2 46	2 65	2·77	2 83
Δ		Discrepancies, (v − v′)			..	..	..	..	..	..	..		− 04	+ 10	− 06	− 02

CITIES PAST A VERTICAL — TABLE XX.

NON-CENTRAL VERTICAL

and 1″ tin Tube-Rods]

less than the central depth shown by the Gauge *see Pla* XVI

6								7	8			9	
VELOCITIES *vertical of Experiment.* mean of three observations. Depths (*z*)							Bed velocity.	DISCHARGE past the vertical	MEAN VELOCITY past the vertical. Various Approximations.			DIFFERENCE	
									Discharge / Depth	Mid-depth Velocity	Rod Velocity Mean of 3 trials		
4	5	6	7	8	9	10	v_H	D	U	$v_{\frac{1}{2}H}$	u	$(v_{\frac{1}{2}H} - U)$.	$(u - U)$
2 73	2 83	2 68	2 78	2 46	..	..	2 31	22 8	2 69	2 75	2 80	+ 06	+ 11
2 89	2 94	3 00	2 88	2 73	..	..	2 6	24 1	2 84	2 90	2 88	+ 06	+ 04
2 68	2 83	2 68	2 50	2 68	..	..	2 7,	22 2	2 62	2·72	2 88	+ 10	+ 26
2 63	2 88	2 73	2·73	2 50	..	..	2 39	23 0	2 71	2 69	2 88	- 02	+ 17
2 54	2 83	2 59	2 68	2 50	..		2 42	22 2	2 62	2 61	2 80	- 01	+ 18
2 ,8	3 06	2 78	2 83	2 46	..	..	2 29	22 1	2 61	2 84	2 80	+ 23	+ 19
2 68	2 63	2 46	2 88	2 42	..	..	2 21	22 1	2 61	2 67	2 88	+ 06	+ 27
2 ,8	2 73	2 59	3 00	2 42	..	..	2 18	22 4	2 66	2 77	2 86	+ 11	+ 20
2 59	2 78	2 68	2 46	2 59	..	.	2 6,	21 4	2 56	2 62	2·94	+ 06	+ 38
2 50	2 63	2 59	2 59	2 54	.	..	2 52	21 9	2 61	2 52	2·68	- 09	+ 0,
2 83	2 59	2 73	2 73	2 54		..	2 4	22 2	2 65	2 79	2 80	+·14	+ 15
2 59	2 38	2 68	2 68	2 46	..	..	2 3,	21·0	2 51	2 55	2 7,	+ 04	+ 22
2 59	2 73	2 59	2 88	2 50	..	..	2 30	21 2	2 55	2 61	2 80	+ 06	+ 25
2 68	2 6,	2 73	2 63	2 54	.	..	2 51	21 ,	2 59	2 67	2 8,	+ 08	+ 24
2 68	2 68	2 68	2 59	2 46	..	..	2 42	21 4	2 59	2 68	2 78	+ 09	+ 16
2 83	2 73	2 68	2 68	2 54	..	.	2 ,0	22 0	2 66	2 82	2 6,	+ 16	- 01
38	68	54	54	31	..	..	59	3 1	33	38	·29	32	39
2 69	2 68	2 62	2 72	2 52	.	..	2 44	22 1	2 63	2 70	2 81	+ ·07	+ 18
2 69	2 70	2 67	2 62	2 54	..	..	2 50	21 9	2 61	2 70	..	+ 09	..
00	- 02	- 03	+ 10	- 02	..	..	- 0[illegible]	+ 2	+ 02	00	..	- 02	..
2 89	2 75	2 68	2 46	..	..	..	2 44	19·2	2·71	2·88	2 73	+·17	+·0[illegible]
2 80	2 78	2 61	2 68	..	..	..	2 68	19 ,	2 71	2 77	2·96	+·06	+ 25
2 78	2 70	2 6,	2 17	..	..	..	2 17	18 4	2 68	2 82	2 9,	+ 14	+ 25
2·91	2 86	2 56	2 65	..	..	..	2·6[illegible]	19 1	2 77	2 84	2 9,	+·07	+ 20
2 63	2 86	2 80	2 75	..	..	..	2 7[illegible]	19 4	2·80	2 72	3 00	- 08	+ 20
·28	16	24	38	..	..	..	·38	1·0	12	·16	2,	23	·23
2 80	2·79	2 66	2 54	..	..	..	2·54	19·0	2 73	2 81	2 92	+·0[illegible]	+ 12
2 83	2 76	2 64	2 46	..	..	..	2 46	18·9	2·71	2 83	..	+ 12	..
- 03	+ 03	+ 02	+·08	..	..	..	+ 0[illegible]	+ 1	+ 0[illegible]	- 02	..	- 04	..

41′ 4″ LEFT OF CENTER, (*c*, 73′ from Left Bank.

SUBSURFACE AND MEAN VELO-

SOLÁNI RIGHT AQUEDUCT—

[*Instruments* { *Nos* 31 *and* 32. $1\frac{5}{8}$" *Double-Floats,*
No. 32. 3" *Double-Floats,*

Serial No	1 Date 18 6	2 Depth Actual H	2 Depth Variation	2 Length of Rod l	3 Fall of Water-Surface. Upper 5 miles F_1	3 Fall of Water-Surface. Lower 4½ miles F_2	3 Fall of Water-Surface. Local Slope S	4 Wind From Direction.	4 Wind From Velocity	4 Wind To Direction	4 Wind To Velocity	5 Timekeeper's Initial	Subsurface past the ver [Each Velocity is the Nominal 0	1	2	3
Series 31.	1 3-'76	8 58	00	8	5 82	4 73	?	..	0	..	0	W	2 65	2 97	3 06	2 88
	" "	58	00	8	5 77	"	?	..	0	..	0	H	2 83	3 00	2 97	2 97
	" "	58	00	8	"	"	?	..	0	..	0	W	2 94	3 09	2 97	3 03
	" "	58	00	8	"	"	?	..	0	.	0	H	2 91	2 73	2 91	2 88
	8 3 "	43	00	8	5 77	4 43	190	..	0	..	0	W	2 70	2 80	3 06	2 94
	" "	43	00	8	"	"	"	..	0	.	0	H	2 59	2 97	2 83	2 91
	" "	43	00	8	"	"	"	..	0	..	0	W	2 70	2 78	2 88	3 06
	" "	43	00	8	"	"	"	..	0	S	7	H	2 88	2 78	3 05	2 80
	2 3 "	40	00	8	5 80	4 60	?	.	0		0	W	2 56	2 94	2 94	2 80
	" "	40	00	8	"	"	?	..	0	..	0	H	2 80	2 75	2 75	2 78
	" "	40	+ 03	8	"	"	?	..	0	..	0	W	2 65	2 94	2 78	3 00
	" "	43	+ 03	8	5 82	4 63	?	.	0	..	0	H	2 50	2 86	2 80	2 88
	" "	45	00	8	5 80	4 65	?	..	0	..	0	W	2 59	2 97	3-06	3 06
	6-3 "	35	00	8	5 75	4 55	?	..	0	..	0	H	2 80	2 75	3-06	2 86
	" "	35	00	8	"	"	?	..	0	..	0	W	2 70	3 03	3 13	3 03
	" "	35	00	8	5 85	"	?	..	0	..	0	H	2 73	2 83	3 13	2 97
δ	Range,	23	..	0	10	·30	?	..	..	..		..	44	36	38	28
v	Means of 16	8 45	..	8	5 79	4 59	?		S *l*			.	2 72	2 80	2 96	2 93
v		Parabolic, (v)			..	..		..	..	..		..	2 74	2 85	2 94	2 99
Δ		Discrepancies, (v − v')			..	..		..	..	..		..	− 02	+ 04	+ 02	− 06
Series 32.	8 2 '76	8 75	00	8	5 85	4 75	?	..	0	..	0	W	3 13	3 30	3 23	3 33
	" "	75	00	8	"	"	?	..	0	.	0	H	3 00	3 23	3 45	3 26
	23-2- "	·65	00	8	5 75	4·75	?	..	0	..	0	W	3 33	3 30	3 49	3 33
	" "	·65	00	8	"	"	?	..	0		0	H	2 91	3 23	3 30	3 49
	" "	65	00	8	5 85	"	?	..	0	..	0	W	3 26	3 19	3 45	3 41
	" "	65	00	8	"	"	?	..	0	..	0	H	3 06	3 09	3 19	3 45
	" "	65	00	8	"	"	?	..	0	..	0	W	3 37	3 30	3 37	3 53
	29 2- "	65	00	8	5 80	4 75	?	..	0	..	0	W	3 00	3 19	3 41	3 61
	" "	·65	00	8	"	"	?	..	0	..	0	H	2 97	3 06	3 13	3 45
	26 2- "	60	00	8	5 80	4 70	190	..	0	..	0	H	2 88	3 00	3 26	3 41
	" "	60	00	8	"	"	"	..	0	..	0	W	3·19	2 97	3 26	3 19
	" "	60	00	8	"	"	"	..	0	..	0	H	2 83	3 06	3·19	3 49
	" "	·60	00	8	"	"	"	..	0	..	0	W	3 00	3 19	3 49	3 49
	28-2- "	60	00	8	5 80	4·70	?	S	4	S	4	H	3·06	3 41	3 13	3 30
	" "	60	00	8	"	"	?	S	4	..	0	W	2 97	3 49	3·45	3 45
	" "	60	00	8	"	"	?	..	0	..	0	H	3 13	3·45	3 26	3 41
δ	Range,	15	..	0	·10	05	?	..	.	..	.	..	54	·52	·36	42
v	Means of 16	8·64	..	8	5·81	4 73	?		S *l*			..	3 07	3 22	3·32	3·41
v'		Parabolic, (v')			..	..		..	..	..		..	3 07	3 22	3 32	3 38
Δ		Discrepancies, (v − v)			..	..		..	..	..		..	00	00	00	+ 03

CITIES PAST A VERTICAL.

TABLE XXI.

NON CENTRAL VERTICALS

and 1" tin Tube-Rods, except on 8-2-'76 and 1" wood Rods on 8-2-'76.]]

6								7	8			9		
VELOCITIES tical of Experiment m an of three observati ns							Bed velocity	DISCHARGE past the vertical	MEAN VELOCITY past the vertical Various Approximations.			DIFFERENCES		
Depths (s)									Discharge. Depth	Mid depth Velocity.	Rod Velocity Mean of 6 trials			
4	5	6	7	8	9	10	v_H	D	U	$v_{\frac{1}{2}H}$	u	$(v_{\frac{1}{2}H} - U)$	$(u - U)$	
3·06	2·97	2·97	2·80	2·63	..	..	2·53	24·8	2·89	3·03	3·06	+ ·14	+·17	41¼ LEFT OF CENTRE.
3·13	3·03	3·16	3·06	2·73	..	..	2·54	25·6	2·99	3·10	3·11	+·11	+ 12	
3·03	3·19	2·86	2·91	2·88	..	..	2·86	25·8	3·01	3·08	3·13	+ 07	+·12	
2·88	2·80	3·16	2·86	2·68	..	..	2·58	24·4	2·84	2·86	2·90	+ 02	+ 06	
2·91	3·03	3·03	2·86	2·70	..	..	2·6	24·5	2·90	2·94	2·9	+ 04	+ 03	
3·00	2·91	2·94	3·00	2·38	..	..	2·11	24·2	2·87	2·98	3·00	+ 11	+·13	
3·03	3·09	3·06	2·94	2·65	..	..	2·53	24·7	2·93	3·04	3·01	+ 11	+ 08	
3·00	2·97	2·97	2·91	2·70	..	..	2·61	24·3	2·88	2·99	3·06	+ 11	+ 18	
3·09	2·97	2·80	2·54	2·65	..	..	2·69	23·7	2·82	3·07	2·91	+ 25	+·12	
2·94	2·86	2·80	2·94	2·73	..	..	2·6	23·7	2·82	2·92	2·8	+·10	+·04	
3·03	3·00	3·00	2·83	2·75	..	..	2·72	24·9	2·91	3·02	2·78	+ 11	− 13	
2·97	3·19	2·88	3·00	2·91	..	..	2·87	24·7	2·93	3·02	2·99	+ 09	+ 06	
2·88	3·00	2·97	3·03	2·83	..	..	2·74	25·1	2·97	2·91	2·93	− 06	+ 02	
3·13	3·13	3·03	3·06	2·65	..	..	2·51	24·6	2·95	3·13	2·8	+ 18	− 15	
2·91	3·13	2·86	3·09	2·78	..	..	2·67	25·1	3·00	2·95	2·9	− 05	− 07	
2·94	2·91	2·83	2·88	2·63	..	..	2·54	24·1	2·89	2·93	2·9	+ 04	+ 08	
.25	.39	.36	.55	.53	..	..	.76	2·1	.20	.27	.3	.31	.33	
3·00	3·01	2·96	2·92	2·71	..	..	2·61	24·6	2·91	3·00	2·97	+ ·09	+ 06	
3·01	3·00	2·95	2·88	2·77	..	..	2·71	24·6	2·91	3·01	..	+ 10	..	
− 01	+ 01	+ 01	+ 04	−·06	..	..	− 10	0	00	− 01	..	− 01	..	
3·26	3·23	3·41	3·26	3·13	..	..	3·0	28·5	3·26	3·35	3·5	− 01	+·27	40 LEFT OF CENTRE.
3·33	3·26	3·16	3·19	3·06	..	..	2·96	28·1	3·22	3·30	3·3	+ 08	− 1	
3·53	3·41	3·37	3·13	3·06	..	..	3·01	28·6	3·31	3·49	3·1	+ 18	− 14	
3·41	3·30	3·37	3·19	3·06	..	..	2·98	28·3	3·27	3·37	3·3	+ 10	+ 03	
3·30	3·33	3·41	3·26	3·06	..	..	2·9	28·4	3·29	3·31	3·4	+ 02	+ 14	
3·37	3·37	3·37	3·33	3·00	..	..	2·76	28·5	3·26	3·37	3·24	+ 11	−·02	
3·53	3·23	3·26	3·06	3·13	..	..	3·18	28·1	3·29	3·43	3·41	+ 14	+ 12	
3·45	3·53	3·37	3·33	3·19	..	..	3·16	29·2	3·37	3·48	3·3	+ 11	− 02	
3·30	3·37	3·19	3·06	3·13	..	..	3·15	27·6	3·21	3·32	3·31	+ 11	+·10	
3·33	3·30	3·19	3·09	2·94	..	..	2·8	27·2	3·16	3·25	3·3	+ 09	+ 15	
3·37	3·23	3·45	3·13	2·94	..	..	2·8	28·5	3·32	3·33	3·41	+ 01	+ 09	
3·23	3·30	3·19	2·97	3·00	..	..	3·02	27·6	3·17	3·25	3·4	+ 08	+ 2	
3·45	3·33	3·33	3·09	3·09	..	..	3·06	28·1	3·28	3·41	3·41	+ 13	+·12	
3·37	3·45	3·41	3·26	3·03	..	..	2·89	28·2	3·29	3·39	3·3	+ 10	+ 01	
3·45	3·57	3·49	3·26	3·13	..	..	3·06	29·2	3·39	3·49	3·4	+ 10	+ 0	
3·41	3·49	3·41	3·41	3·09	..	..	2·96	28·9	3·37	3·43	3·4	+ 06	+ 0	
.30	.34	.33	.44	.25	..	..	.39	2·0	.23	.24	.3	.17	.4	
3·37	3·36	3·34	3·19	3·07	..	..	2·9	28·6	3·28	3·37	3·3	+ ·09	+ 0	
3·40	3·38	3·31	3·20	3·06	..	..	2·94	28·3	3·27	3·40	..	+ 13	.	
−·03	− 02	+·03	−·01	+ 01	..	..	+ 03	.0	+·01	−·03	..	− 04		

SUBSURFACE AND MEAN VELO-

Solani Right Aqueduct—

[*Instruments* { *No* 33 $1\frac{5}{8}$″ *Double-Floats*, *No* 34. 3″ *Double Floats*,

Serial No	1 Date 1876 78	2 Depth Actual H	Variation	Length of Rod l	3 Fall of Water-Surface. Upper 6 miles F_1	Lower 4½ miles F_2	Local Slope S	4 Wind From Direction	From Velocity	To Direction	To Velocity	5 Timekeeper's Initials	Subsurface past the ver Each Velocity is the Nominal 0	1	2	3
Series 33.	27-3-'76	8 70	00	8	5 80	4 67	190	W	4	S	15	G	3 09	3 66	3 45	3 61
	28-3	70	00	8	5 90	4 70	7300	N b W	4	V	1	P	3 26	3 09	3 45	3 37
	,, ,,	70	00	8	,,	,,		V	1	..	0	G	3 45	3 30	3 45	3 49
	23 2 76	68	+ 05	8	5 82	4 78	?	SW	6	S	15	H	3 09	3 26	3 45	3 41
	29 2 ,,	65	00	8	5 85	4 75	?	.	0	S	5	W	3 09	3 26	3 13	3 19
	,, ,,	65	00	8	,,	,,	?	S	5	S	12	H	2 88	3 13	3 33	3 19
	25 3 76	63	00	8	5 87	4 63	190	W	6	NW	3	G	3 41	3 53	3 45	3 45
	,, ,,	63	00	8	,,	,,		NW	3	..	0	P	3 41	3 41	3 80	3 45
	,, ,,	63	00	8	,,	,,	19		0	.	0	G	3 41	3 45	3 57	3 57
	26 3 ,,	62	00	8	5 88	4 62	19		0	S	0	P	3 37	3 49	3 57	3 53
	28 3 ,,	60	00	8	5 80	4 70	?	.	0	S	5	W	3 06	3 41	3 49	3 33
	,,	60	00	8	,,	,,	?	S	5	SW	4	H	3 00	3 23	3 16	3 30
	18 4 ,,	53	00	8	5 84	4 53	200	..	0		0	P	2 75	3 00	3 16	3 23
	,, ,,	52	− 03	8	5 88	4 52	,,		0	V	1	R	2 94	3 26	3 41	3 37
	,,	50	00	8	5 90	4 50	,,	V	1	..	0	P	3 19	3 33	3 53	3 66
	,,	50	-00	8	,,	,,	,,	..	0	V	1	R	2 91	3 45	3 49	3 49
δ	Range,	20	,	0	10	23	7166	..		.		..	70	66	67	47
v	Means of 16	8 62		8	5 86	4 64	7224		SSW 3			..	3 14	3 33	3 43	3 43
v′		Parabolic (v)			..	.	..	.					3 15	3 29	3 39	3 46
Δ		Discrepancies (v − v′)			..	..	..	.					− 01	+ 04	+ 04	− 03
Series 34.	10-1 ,,	9 53	+ 05	9	5 77	5 33	Not observed	S	14	S	18	W	3 37	3 66	3 97	3 87
	,,	50	00	9	5 70	5 30		S	10	S	21	H	3 66	3 61	3 95	3 73
	11 1 ,,	45	00	9	5 70	5 20		V	8	SE	8	W	3 55	3 73	3 92	4 00
	,, ,,	45	00	9	5 80	,,		SE	8	S	10	H	3 41	3 70	3 75	3 70
	14-1 ,,	43	00	9	5 77	5 23		0	N	9	H	3 49	3 77	3 80	3 95
	,, ,,	43	00	9	,,	,,		N	9	S	20	W	3 53	3 97	3 90	3 97
	7 1 ,,	40	00	9	5 80	5 30		..	0	NE	8	H	3 75	3 40	3 90	3 82
	12 1 ,,	40	00	9	5 80	5 20		..	0		0	W	3 40	3 90	3 82	3 8.
	,,	40	00	9	,,	,		V	1	S b W	8	H	3 53	3 75	3 92	3 82
	,,	40	00	9	,,	,,		S b W	8	S b W	1	W	3 64	3 77	3 68	3 90
	16 1 ,,	40	00	9	5 80	5 20		..	0	..	0	H	3 51	3 64	3 61	3 68
	,, ,,	40	00	9	,,	,,			0	V	4	W	3 47	3 75	3 87	3 97
	,, ,,	40	00	9	,,			V	4	N	12	H	3 37	3 64	3 85	3 77
	17 1 ,,	40	00	9	5 80	5 20		..	0	..	0	W	3 55	3 75	3 80	3 92
	6-1 ,,	30	00	9	5 85	5 25		V	1	V	1	H	3 26	3 64	3 87	3 90
	,, ,,	30	00	9	,,	,,		V	1	V	1	W	3 49	3 40	3 85	3 85
δ	Range,	20		0	10	15	..	.		..			49	36	36	32
v	Means of 16,	9 42	.	9	5 80	5 24	..		S 4			..	3 52	3 73	3 84	3 85
v′		Parabolic, (v)			..	..	..	..	..	..		..	3 55	3 70	3 81	3 86
Δ		Discrepancies, (v − v′)			..	..	..	..	..	..		..	− 03	+ 03	+ 03	− 01

CITIES PAST A VERTICAL — TABLE XXII.

NON-CENTRAL VERTICALS.

and 1″ Rods of wood in 1876, of tin in 1878 and 1″ wood Rods]

6								7	8			9		
VELOCITIES tical of Experim nt mean of three observa ons)							Bed velocity	DISCHARGE past the vertical	MEAN VELOCITY past the vertical Various Approximations			DIFFERENCES		
Depths (z)									Dis harge / Depth	Mid depth Velocity.	Rod Velocity Mean of 6 trials			
4	5	6	7	8	9	10	v_H	D	U	$_1H$	$_2$	$(_1H - U)$	$(_2 - U)$	
3 49	3 49	3 41	3 53	3 37		..	3 26	30 4	3 50	3 49	3 49	− 01	− 01	40′ LEFT OF CENTRE.
3 33	3 57	3 49	3 49	3 45	..	..	3 42	29 6	3 39	3 41	3 4	+ 02	+ 04	
3 61	3 45	3 49	3 41	3 33	..	..	3 37	29 8	3 43	3 55	3 57	+ 12	+ 14	
3 33	3 33	3 37	3 26	3 06	.	..	2 92	28 5	3 29	3 3,	3 41	+ 04	+ 12	
3 53	3 23	3 30	3 49	3 37	.	..	3 29	28 3	3 30	3 43	3 3,	+ 13	+ 07	
3 26	3 13	3 06	3 23	3 0,	.	..	2 90	27 .	3 15	3 22	3 14	+ 07	− 01	
3 53	3 53	3 41	3 57	3 61	..	.	3 64	30 3	3 51	3 53	3 5[illegible]	+ 02	+ 04	
3 2,	3 33	3 66	3 66	3 66	..	..	3 66	30 3	3 51	3 26	3 4	− 25	− 04	
3 45	3 90	3 53	3 66	3 41	..	..	3 2,	30 .	3 57	3 59	3 33	+ 02	− 24	
3 3,	3 41	3 37	3 1,	3 70	.	..	4 0	29 7	3 44	3 35	3 3	− 09	− 09	
3 49	3 37	3 33	3 23	3 19	.	.	3 17	28 7	3 3,	3 45	3 41	+ 12	+ 06	
3 41	3 41	3 49	3 33	3 26	.	..	3 22	28 .	3 34	3 41	3 3,	+ 07	− 01	
3 41	3 53	3 57	3 33	3 37	..	..	3 39	28 0	3 29	3 44	3 53	+ 15	+ 24	
3 53	3 49	3 4	3 41	3 26	..	..	3 18	28 7	3 37	3 52	3 43	+ 15	+ 06	
3 49	3 66	3 49	3 53	3 19	..		3 02	29 6	3 48	3 53	3 5,	+ 05	+ 09	
3 57	3 49	3 37	3 57	3 23	..	..	3 06	29 .	3 44	3 55	3 3,	+ 11	− 05	
38	77	60	53	67	..	..	1 15	3 7	42	37	43	40	48	
3 44	3 45	3 42	3 43	3 34	..	..	3 29	29 .	3 40	3 44	3 42	+ 04	+ 02	
3 49	3 49	3 45	3 37	3 26	..	..	3 1,	29 1	3 38	3 49	..	+ 11	..	
− 05	− 04	− 03	+ 06	+ 08	..	..	+ 12	+ 2	+ 02	− 05	..	− 07	..	
3 70	3 75	3 66	3 57	3 47	3 19	..	3 04	34 6	3 64	3 74	3 65	+ 10	+ 01	37½ LEFT OF CENTRE.
3 75	4 17	3 85	3 66	3 49	3 51	..	3 52	35 8	3 75	4 08	3 65	+ 33	− 10	
3 8,	3 68	3 70	3 55	3 43	3 16	..	3 04	34 6	3 66	3 73	3 69	+ 07	+ 03	
3 61	3 7[illegible]	3 64	3 75	3 53	3 45	..	3 41	34 7	3 65	3 73	3 68	+ 08	+ 03	
4 05	4 00	3 68	3 55	3 33	3 30	..	3 29	35 0	3 71	4 01	3 6	+ 30	− 10	
3 85	3 75	3 64	3 57	3 37	3 23	..	3 1	34 8	3 69	3 8	3 74	+ 09	+ 05	
4 00	3 85	3 92	3 64	3 49	3 13	..	3 90	35 0	3 72	3 89	3 7	+ 17	+ 05	
3 68	3 91	3 66	3 75	3 41	3 39	..	3 38	34	3 72	3 8,	3 68	+ 13	− 04	
3 73	3 75	3 68	3 49	3 3,	3 26	..	3 2[illegible]	34 2	3 64	3 74	3 6,	+ 10	+ 03	
3 82	3 85	3 87	3 77	3 45	3 19	..	3 09	34 8	3 70	3 84	3 7[illegible]	+ 14	+ 01	
3 80	3 70	3 77	3 64	3 33	3 30	..	3 29	33 .	3 61	3 73	3 6[illegible]	+ 12	+ 04	
3 9,	3 70	3 64	3 61	3 4,	3 14	..	3 02	34 4	3 66	3 78	3 66	+ 13	00	
4 11	3 75	3 64	3 66	3 25	3 41	..	3 46	34 6	3 68	3 86	3 51	+ 18	− 1,	
3 92	3 82	3 64	3 57	3 39	3 19	.	3 11	34	3 6,	3 85	3 72	+ 18	+ 04	
4 05	3 97	3 57	3 61	3 57	3 07	..	3 30	34 6	3 72	4 00	3 73	+ 28	+ 01	
3 80	3 70	3 85	3 53	3 66	3 23	..	3 6[illegible]	34 4	3 68	3 73	3 77	+ 05	+ 0,	
50	49	35	28	35	38	..	53	1 9	14	35	26	28	26	
3 86	3 82	3 71	3 61	3 44	3 28	..	3 21	34 7	3 68	3 83	3 69	+ 15	00	
3 87	3 83	3 75	3 61	3 43	3 21	..	3 10	34 6	3 67	3 33	..	+ 16	..	
− 01	− 01	− 04	00	+ 01	+ 07	..	+ 11	+ 1	+ 01	− 02	..	− 03	..	

see also Series 32

SUBSURFACE AND MEAN VELO-

SOLANI RIGHT AQUEDUCT—

[*Instruments*—3′ *Double Floats,*

Serial No	1 Date 18 6	2 DEPTH Actual H	2 DEPTH Variation	2 Length of Rod l	3 FALL of Water-Surface Upper 5 miles F_1	3 FALL of Water-Surface Lower 4½ miles F_2	3 Local Slope S	4 WIND From Direction	4 WIND From Velocity	4 WIND To Direction	4 WIND To Velocity	5 Timekeeper's Initial	SUBSURFACE past the vel (Each Velocity is the Nominal 0	1	2	3
Series 35	18 1 76	9 63	− 05	9	5 77	5 43	?	S & W	6	NW	10	W	4 03	4 22	4 41	4 08
	,, ,,	60	00	9	5 75	5 40	?	NW	10	SW	14	H	4 20	4 22	4 29	4 26
	,, ,,	58	− 05	9	5 77	5 38	?	SW	14	SW	18	W	4 11	4 20	4 35	4 20
	8 5 ,,	40	+ 06	9	5 80	5 20	205		0	.	0	H	4 29	4 29	4 48	4 32
δ	Range	23	.	0	10	18	?	..	..	.			26	09	19	24
v	Mean of 4	9 50		9	5 79	5 37	?		WSW 7			.	4 16	4 23	4 38	4 22
v		Parabolic, (v)			..	..		..	.	..			4 18	4 24	4 28	4 28
Δ		Discrepancies, (v − v)			.				..				− 02	− 01	+ 10	− 06
Series 36	19 1-'76	9 43	00	9	5 82	5 23	?	..	0	SW	5	H	3 90	4 20	4 26	4 35
	,, ,,	42	− 03	9	5 78	5 22	?	SW	5	SW	9	W	4 17	4 22	4 29	4 17
	,, ,,	40	00	9	5 80	5 20	?	SW	9	S	10	H	4 14	4 38	4 20	4 38
	17 1 ,,	40	00	9	5 80	5 20	?	..	0	..	0	H	4 11	4 20	4 32	4 29
	,, ,,	40	00	9	,	,,	?	..	0	S	9	W	4 20	4 26	4 20	4 22
	,, ,,	40	00	9		,,	?	S	9	S & W	14	H	3 90	4 17	4 26	4 08
	5 5 ,,	30	00	9	5 85	5 20	205	..	0	..	0	W	4 42	4 38	4 38	4 35
	,, ,,	30	00	9	,,	,	,,	..	0	..	0	H	4 05	4 22	4 22	4 58
	6-5- ,,	30	00	9	5 85	5 20	205	..	0	..	0	W	4 20	4 61	4 48	4 29
	,, ,,	30	00	9	,	,,	190	..	0	..	0	H	4 35	4 29	4 55	4 41
	22 1- ,,	30	00	9	5 80	5 20	?	V	/	V	/	W	4 26	4 22	4 22	4 11
	,, ,,	29	− 02	9	5 81	5 19	?	V	/	V	/	H	4 32	4 11	4 17	4 17
	,, ,,	28	00	9	5 82	5 18	?	V	8	S	20	W	3 92	4 14	4 29	4 26
	24-1- ,,	25	00	9	5 75	5 15	?	..	0	SW	6	H	4 08	4 00	4 11	4 05
	,, ,,	25	00	9	5 80	,,	?	SW	5	NW	21	W	4 14	4 05	4 08	4 17
δ	Range	18		0	10	10	?	..	..	..	.	..	45	61	47	53
v	Means of 15	9 33	..	9	5 81	5 20	?		SW & S 3			.	4 13	4 23	4 27	4 26
v′		Parabolic, v)			.	..		.	..	..		..	4 16	4 21	4 23	4 23
Δ		Discrepancies, (v − v)			..	.		..	..	..		.	− 03	+ 02	+ 04	+ 03

TABLE XXIII.

CITIES PAST A VERTICAL

Non-Central Vertical,

and 1" wood Rods]

6								7	8			9	
Velocities tical of Experiment. mean of three observations] Depths (s)							Bed velocity	Distance past the vertical	Mean Velocity past the vertical Various Approximations Discharge / Depth	Mid-depth Velocity	Rod Velocity Mean of 6 trials	DIFFERENCES	
4	5	6	7	8	9	10	v_B	D	U	$v_{\frac{1}{2}B}$	u	$(v_{\frac{1}{2}B} - U)$	$(u - U)$
4 38	4 00	4 08	3 87	4 05	3 70	..	3 48	39 3	4 08	4 07	3 79	− 01	− 38
4 22	4 14	4 20	4 03	3 73	3 75	..	3 76	39 3	4 09	4 16	3 9	+ 07	− 12
4 14	4 05	3 97	3 73	3 75	3 47	..	3 3	38 2	3 99	4 07	3 8	+ 08	− 14
4 41	4 22	4 32	4 06	4 11	3 92	..	3 84	39 3	4 24	4 28	4 1	+ 04	− 19
.27	22	35	33	38	45	..	53	1 ,	25	21	45	09	29
4-29	4 10	4 14	3-92	3 91	3 71	..	3 60	39 ?	4 10	4-15	3 9?	+ 0?	− 16
4 25	4 19	4 10	3 99	3 84	3 66	..	3 55	39 1	4 09	4 21	..	+ 12	..
+ 04	− 09	+ 04	− 07	+ 07	+ 05	..	+ 05	+ 1	+ 01	− 06	..	− 07	..
4 03	4 17	4 05	3 82	3 55	3 55	..	3 5?	37 7	3 99	4 13	3 85	+ 14	− 14
4 14	4 05	3 92	3 82	3 64	3 68	..	3 7?	37 7	4 01	4 08	3 86	+ 07	− 15
4 20	3 95	3 90	3 75	3 64	3 64	.	3 6?	37 7	4 01	4 02	4 05	+ 01	+ 04
4 05	4 17	3 95	3 85	3 64	3 49	.	3 43	37 7	4 01	4 13	3 87	+ 12	− 14
4 32	3 97	3 92	3 68	3 68	3 57	.	3 5?	37 6	4 00	4 07	3 87	+ 07	− 13
4 22	4 00	3 92	3 87	3 66	3 66	..	3 66	37 5	3 99	4 07	3 92	+ 08	− 07
4 20	4 22	4 20	3 90	3 92	3 82	..	3 79	38 7	4 16	4 21	4 12	+ 05	− 04
4 29	4 35	4 48	4 03	4 08	4 20		4 24	39 5	4 ?5	4 3?	4 24	+ 08	− 01
4 5?	4 26	4 14	4 00	3 87	3 87		38	39 ?	4 25	4 37	4 04	+ 12	− 21
4 29	4 29	4 35	4 00	4 26	3 95	.	3 8?	39 7	4 27	4 29	4 12	+ 02	− 15
3 97	3 8?	3 90	3 8?	3 59	3 43	..	3 38	36 ?	3 93	3 89	3 8?	− 04	− 06
4 05	4 03	4 03	3 64	3 55	3 6?	.	3 6?	36 7	3 95	4 04	3 92	+ 09	− 03
4-08	3 8,	4 08	3 80	3 75	3 70	..	3 69	37 1	3 99	3 95	3 8,	− 04	− 12
3 95	3 8?	3 80	3 68	3 ?9	3 73	.	3 7,	3? 8	3 87	3 89	3 79	+ 02	− 08
3 97	4-14	3 92	3 97	3 7?	3 59		3 56	36 ?	3 97	4 ?8	3 88	+ 11	− 09
63	50	58	39	71	77	..	86	3 9	40	48	45	18	25
4 15	4 08	4 04	3 84	3 74	3 70	..	3 6?	37 8	4 04	4 10	3 95	+ 06	− 09
4 19	4 12	4 02	3 90	3 74	3 56	.	3 49	37 ,	4 04	4 15	..	+ 11	..
− 04	− 04	+ 02	− 06	00	+ 14	..	+ 20	+ 1	00	− 05	..	− 05	..

30′ LEFT OF CENTRE.
see also Series 37.

SUBSURFACE AND MEAN VELO-

SOLANI RIGHT AQUEDUCT—

[*Instruments—3″ Double-Floats,*

Serial No.	1 Date 1876	2 Depth Actual H	2 Depth Variation.	2 Length of Rod l	3 Fall of Water-Surface Upper 6 miles F_1	3 Fall of Water-Surface Lower 4½ miles F_2	3 Local Slope z	4 Wind From Direction	4 Wind From Velocity	4 Wind To Direction	4 Wind To Velocity	5 Timekeeper's Initial	Subsurface past the (Each Velocity is the Nominal 0	1	2	3
Series 37.	27-1 '76	9 00	00	9	5 80	5 00	Not observed.	..	0	..	0	H	4·03	4 03	4 22	4 11
	" "	00	00	9	5 85	"		..	0	..	0	W	4 14	4 22	4 22	4 14
	" "	00	00	9	"	"		..	0	S	10	H	4 03	4 03	4 00	3 95
	" "	05	00	9	"	"		S	10	S	12	W	4 08	4 08	3·90	4 08
	28 1- "	00	00	9	5 75	5·05		..	0	SW	8	H	4 11	4 17	4 08	3 93
	" "	00	00	9	5 80	"		SW	8	..	0	W	4 14	4 14	4 11	4 26
	" "	00	00	9	"	"		.	0	..	0	H	4 29	4 08	4 08	4 08
	" "	00	00	9	"	"		..	0	S	12	W	4 00	4 08	4 05	3 95
	29 1- "	03	00	9	5 82	4 98		..	0	..	0	H	4 14	4 22	4 11	4 20
	" "	03	00	9	5 87	"		..	0	.	0	W	4 14	4 32	4 44	4 05
	" "	03	00	9	"	"		.	0	SW	7	H	4 17	4 17	4 20	4 22
	" "	03	00	9	"	"		SW	7	SW	5	W	4 20	4 26	4 29	4 17
	31 1- "	8 90	00	9	5 75	4 95		..	0	..	0	H	4 29	4 22	4 03	4 08
	" "	95	00	9	5 85	"		..	0	..	0	W	4 26	4 08	4 17	4 05
	" "	90	00	9	"	"		..	0	..	0	H	4 08	4 08	4 20	3 97
	" "	90	00	9	"	"		..	0	..	0	W	4 03	4 14	4 20	4 05
	1-2- "	90	00	9	5 80	4 90		..	0	..	0	H	3 95	4 20	4 08	4 14
	" "	90	00	9	5 85	"		..	0	S	19	W	4 00	4 17	4 05	4 38
d	Range,	15	..	0	12	15	..	..		..		.	34	20	54	46
v	Means of 18,	9 01	..	9	5 84	4 98	..		S *b* W 3			..	4 12	4 15	4 14	4 10
v'		Parabolic, (*v*)			..	..	..	..	..	..	..	..	4 13	4 14	4 14	4 11
Δ		Discrepancies, (*v* — *v*)			..	..	..	..	..	..	..	..	− 01	+ 01	00	− 01
Series 38.	16 2-'76	9 10	00	9	5 80	5 10	Not observed.	..	0	..	0	H	3 70	3 73	3 77	3 75
	" "	10	00	9	"	"		..	0	.	0	W	3 ,0	3 87	3 70	3 92
	" "	10	00	9	"	"		..	0	..	0	H	3 80	3 70	3 61	3 80
	" "	10	00	9	"	"		..	0	..	0	W	3 ·6	3 82	3 70	3 77
	3-2- "	15	00	9	5 75	5 15		V	10	S	9	H	3 92	3 92	4 00	4 08
	" "	15	00	9	6 05	"		S	9	S	20	W	3 82	4·00	4·03	4 03
	17-2 "	15	00	9	5 75	5 05		..	0	..	0	H	3 37	3 73	3 70	3 85
	" "	18	+ 05	9	5 92	5 08		..	0	..	0	W	3 ·3	3 47	3 90	3 77
	" "	20	00	9	5 90	5 10		..	0	..	0	H	3 49	3 64	3 85	3 85
	" "	23	+ 05	9	5 87	5 13		..	0	S	0	W	3 57	3 59	3 ,0	3 80
	" "	25	00	9	5 80	5 15		S	8	S	0	H	3 57	3 73	3 75	3 73
	" "	28	+ 05	9	5 82	5 18		S	9	S	11	W	3 43	3 80	4 00	3 82
d	Range,	18	..	0	30	13	..	..	.	..	.	..	55	53	42	35
v	Means of 12,	9 17	..	9	5 84	5 12	..		S 4			..	3 63	3 75	3 81	3 80
v		Parabolic, (*v*)			..	..	..	..	..	..	.		3 63	3 75	3 83	3 87
Δ		Discrepancies, (*v* — *v*)			..	.	..	..	..	..	..		00	00	− 02	− 02

CITIES PAST A VERTICAL — TABLE XXIV.

NON-CENTRAL VERTICALS

and 1″ wood Rods]

6								7	8			9		
VELOCITIES vertical of Experiment (mean of three observations)							Rod velocity.	DISCHARGE past the vertical	MEAN VELOCITY past the vertical — Various Approximations			DIFFERENCES		
Depths (z)									Discharge / Depth	Mid-depth Velocity	Rod Velocity (mean of 6 trials)			
4	5	6	7	8	9	10	v_n	D	U	$v_{.5}$	u	$(v_{.5} - U)$	$(u - U)$	
4 05	4 08	3 66	3 87	3 68	3 45	..	3 44	3o 7	3 95	4 07	3 69	+ 12	− 26	30′ LEFT OF CENTRE (see also Series 35, 36)
4 o8	4 08	3 8,	3 85	3 68	3 o3	..	3 52	36 0	4 04	4 22	3 67	+ 18	− 37	
4 11	4 o,	3 53	3 64	3 66	3 59	..	3 59	3o 1	3 88	4 08	3 68	+ 20	− 20	
3 97	3 87	3 77	3 73	3 64	3 47	..	3 46	3o 0	3 87	3 92	3 69	+ 05	− 18	
4 00	3 90	3 95	4 05	3 68	3 61	..	3 61	3o 8	3 96	3 95	3 71	− 01	− 25	
4 05	4 00	3 92	3 61	3 80	3 66	.	3 6	35 '	3 97	4 02	3 65	+ 05	− 32	
4 11	4 14	4 05	3 80	3 68	3 66	.	3 66	36 1	3 99	4 13	3 86	+ 14	− 13	
4 08	3 92	3 66	3 80	3 61	3 66	..	3 66	35 2	3 89	4 00	3 74	+ 11	− 15	
4 08	4 14	4 03	3 59	3 73	3 68	..	3 68	36 1	3 99	4 11	3 68	+ 12	− 31	
3 9,	4 03	3 9o	3 82	3 77	3 64	..	3 64	36 4	4 03	4 00	3 79	− 03	− 24	
4 14	4 3o	3 85	3 82	3 68	3 66	..	3 66	36 5	4 04	4 25	3 92	+ 21	− 12	
4 11	3 95	4 co	3 80	3 61	3 5o	..	3 5[illegible]	36 2	4 01	4 03	3 83	+ 02	− 18	
4 00	4 00	3 82	3 64	3 70	3 57	..	3 5,	3o 2	3 93	4 00	3 74	+ 07	− 19	
4 11	3 85	3 75	3 70	3 55	3 51	..	3 51	3o 0	3 91	3 99	3 74	+ 08	− 17	
4 08	3 90	3 92	3 82	3 64	3 55	..	3 55	3o 3	3 94	3 99	3 81	+ 05	− 13	
3 92	3 87	3 9o	3 73	3 64	3 51	..	3 51	3o 1	3 92	3 90	3 90	− 02	− 02	
4 03	3 95	3 80	3 75	3 85	3 53	..	3 53	3o 2	3 96	3 99	3 6o	+ 03	− 33	
4 00	3 85	3 87	3 55	3 59	3 66	..	3 66	34 8	3 91	3 93	3 85	+ 02	− 06	
46	50	52	50	30	23	..	24	1 8	17	35	29	24	35	
4 07	4 00	3 8o	3 75	3 68	3 58	..	3 58	35 0	3 96	4 03	3 75	+ 07	− 21	
4 06	3 98	3 89	3 77	3 62	3 46	.	3 46	3o 6	3 95	4 02	..	+ 07	..	
+ 01	+ 02	− 04	− 02	+ 06	+ 12	..	+ 12	0	+ 01	+ 01	..	00	..	
3 90	3 7o	3 77	3 53	3 59	3 4[illegible]	..	3 o9	33 6	3 [illegible]o	3 79	3 49	+ 09	− 21	30′ RIGHT OF CENTRE (see also Series 33)
3 68	3 85	3 8o	3 57	3 45	3 19	..	3 16	33 0	3 69	3 77	3 68	+ 08	− 01	
3 87	3 66	3 73	3 45	3 39	3 33	..	3 32	33 0	3 63	3 [illegible]5	3 6,	+ 12	+ 04	
3 85	3 87	3 75	3 7o	3 45	3 4[illegible]		3 41	33 8	3 72	3 66	3 59	+ 14	− 13	
4 00	3 82	3 85	3 73	3 o3	3 4[illegible]	..	3 39	3o 1	3 83	3 90	3 66	+ 07	− 17	
4 03	3 85	4 05	3 64	3 47	3 45	.	3 45	35 2	3 85	3 93	3 71	+ 08	− 14	
4 00	3 87	3 55	3 53	3 59	3 17	.	3 11	33 7	3 68	3 92	3 55	+ 24	− 13	
3 8o	3 77	3 8o	3 66	3 59	3 21	..	3 14	33 7	3 68	3 78	3 56	+ 10	− 10	
4 00	3 97	3 73	3 59	3 7o	3 53	.	3 5o	34 6	3 76	3 98	3 61	+ 22	− 15	
3 97	3 87	3 73	3 77	3 59	3 49		3 47	34 4	3 73	3 9[illegible]	3 64	+ 18	− 09	
3 95	3 92	3 59	3 82	3 55	3 37	..	3 32	34 5	3 73	3 93	3 7o	+ 20	− 03	
3 87	3 8,	3 8o	3 47	3 35	3 28	..	3 2o	34 [illegible]	3 7o	3 87	3 65	+ 17	− 06	
35	31	50	37	35	36	..	39	2 2	22	23	22	17	25	
3 91	3 84	3 76	3 62	3 52	3 35	..	3 33	34 1	3 73	3 87	3 6o	+ 14	− 10	
3 87	3 84	3 77	3 66	3 51	3 33	.	3 29	34 1	3 72	3 86	..	+ 14	.	
+ 04	00	− 01	− 04	+ 01	+ 02	..	+ 04	0	+ 01	+ 01	..	00	..	

SUBSURFACE AND MEAN VELO-

SOLÁNI RIGHT AQUEDUCT—

[*Instruments—3″ Double-Floats,*

Serial No	1 Date 18 6	2 Depth: Actual H	2 Depth: Variation	2 Depth: Length of Rod. r	3 Fall of Water-Surface: Upper 5 miles F_1	3 Fall of Water-Surface: Lower 4½ miles F_2	3 Fall of Water-Surface: Local Slope. s	4 Wind: From Direction	4 Wind: From Velocity	4 Wind: To Direction	4 Wind: To Velocity	5 Timekeeper's Initial.	Subsurface past the vertical (Each Velocity is the Nominal): 0	1	2	3
Series 39.	2 2 '76	8 85	00	9	5 85	4 90	Not observed	..	0	..	0	H	3 80	3 95	4 00	4 05
	" "	85	00	9	"	"		..	0	SW	11	W	3 92	4 00	3·95	4 08
	" "	85	00	9	"	"		SW	11	SW	10	H	3 87	3 80	3 95	4 05
	" "	85	00	9	"	"		SW	10	S	19	W	4 14	3 97	4 03	3 85
δ	Range	00	..	0	00	00	..	..		..		..	34	20	08	23
v	Means of 4	8 85	..	9	5 85	4 95	..	SW ½ S 7				.	3 93	3 93	3·98	4·01
v′		Parabolic, (v′)		..	..		..	..	..	..		.	3 91	3 97	4 00	4 00
Δ		Discrepancies, (v − v′)		..	..		..	..	..	..		..	+ 02	− 04	− 02	+ 01
Series 40.	15 2-'76	8 80	00	8	5 80	4 90	Not observed.	.	0	..	0	H	3 16	3 17	3 41	3 35
	" "	80	00	8	"	"		NW	6	..	0	W	3 19	3 35	3 41	3 41
	14-2 "	70	00	8	5·70	4 80		..	0	..	0	W	3 08	3 33	3 45	3 41
	" "	70	00	8	"	"		..	0	..	0	H	3 08	3 47	3 47	3 52
	" "	70	00	8	5 80	"		E	7	E	9	W	3 31	3 33	3 49	3 39
	" "	70	00	8	"	"		E	9	E	10	H	3 06	3 41	3 30	3 37
	" "	70	00	8	"	"		E	10	SE	18	W	3 14	3 37	3 39	3 35
	11 2- "	70	00	8	5 80	4 70		..	0	SW	0	W	3·09	3 24	3 35	3 45
	" "	70	00	8	"	"		SW	6	SW	12	H	3 05	3 45	3 31	3 35
	" "	70	00	8	"	"		SW	12	S ½ W	19	W	2·97	3 39	3 33	3 37
	10-2- "	65	00	8	5 85	4 65		..	0	..	0	H	3·23	3 53	3 41	3 49
	" "	·65	00	8	5 90	"		..	0	SW	5	W	3 31	3 35	3 57	3 30
	" "	·65	00	8	"	"		SW	5	V	16	H	3 13	3 23	3 39	3 49
	12 2- "	60	00	8	5 80	4·65		SW	4	..	0	H	3 05	3 35	3 30	3 39
	" "	60	00	8	"	"		..	0	S	7	W	3 14	3 21	3 41	3 35
	" "	60	00	8	"	"		S	5	SW	12	H	3 06	3 31	3 30	3 37
δ	Range	20	..	0	20	25	..	..	..	..	.	..	34	36	27	22
v	Means of 16	8 68	..	8	5 80	4 74	..	S 3				..	3 13	3 34	3 39	3 40
v′		Parabolic, (v′)		..	..		..	..	..	..		..	3 16	3·29	3 38	3 42
Δ		Discrepancies, (v − v′)		..	..		..	..	..	..		..	− 03	+ 05	+ 01	− 02

TABLE XXV.

CITIES PAST A VERTICAL

Non Central Verticals

and 1" wood Rods]

6								7	8			9		
Velocities of Experiment. (mean of three observations)							Bed velocity	Discharge past the vertical	Mean Velocity past the vertical — Various Approximations			Differences		
Depths (z)									Discharge / Depth	Mid depth Velocity	Rod Velocity Mean of 6 trials			
4	5	6	7	8	9	10	v_B	D	U	$v_{\frac{1}{2}B}$	u	$(v_{\frac{1}{2}B} - U)$	$(u - U)$	
3·95	3 87	3 77	3 ,0	3 55	3 45	.	3 45	33 9	3 83	3 92	3 66	+ 09	− 17	30 Right of Centre. *see also* Series 38
4 08	3 97	3 95	3 75	3 59	3 37	..	3 5	34 4	3 89	4 03	3 64	+ 14	− 25	
3 9ɔ	3 95	3 92	3 57	3 68	3 53	..	3 53	33 9	3 84	3 9ɔ	3 66	+ ·11	− 18	
4 0ɔ	3 8o	3 75	3 59	3 59	3 43	..	3 43	33·9	3 83	3·94	3 68	+ 11	− ·15	
13	17	20	18	13	16	..	16	5	06	11	04	05	10	
4·01	3 90	3 85	3 6ɔ	3 60	3 45	..	3 45	34 0	3 85	3 96	3 66	+ 11	− 19	
3 97	3 91	3 83	3 71	3 57	3 43	..	3 43	34 2	3 86	3 95	..	+ 09	..	
+ 04	− 01	+ 02	− 06	+ 03	+ 02	.	+ 02	− 2	− 01	+ 01	..	+ 02	..	
3 45	3 23	3 24	3 24	3 08	.	..	2 9	28 6	3 24	3 36	3 31	+ 12	+ 07	37½ Right of Centre
3 41	3 30	3 24	3 03	2 83	.	..	2 67	28 4	3 22	3 37	3 46	+ 15	+ 24	
3 35	3·45	3 26	3 24	3 05	..	..	2 92	28 8	3 30	3 ɔ9	3 41	+ 09	+ 11	
3·39	3 24	3 45	3·26	3 14	..	..	3 06	29 1	3 35	3 ɔ4	3 3ɔ	− 01	00	
3 45	3 41	3 35	3 06	3·03	..	.	3 01	28 7	3 30	3 44	3 41	+ 14	+ 11	
3 39	3 26	3 06	3 11	2 88	..	..	2 72	28 0	3 22	3 34	3 18	+ 12	− 04	
3 49	3 21	3 26	3·16	3 01	..	..	2 90	28 3	3 26	3 39	3 3ɔ	+ 13	+ 09	
3 53	3 47	3 33	3 13	2 94	..	..	2 81	28 5	2 28	3 51	3 38	+ 23	+ 10	
3 51	3 28	3·23	2 91	3 08	..	.	3 20	28 3	3 25	3 43	3 31	+ 18	+ 06	
3 24	3 24	3 30	3·01	2·97	..	.	2 94	28 0	3 22	3 24	3 34	+ 02	+ 12	
3 61	3 43	3 14	3 19	2 90	.	..	2 71	28 8	3 3ɔ	3 55	3 33	+ 22	00	
3 47	3 14	3 31	3 17	3 23	.	.	2 27	28 ɔ	3 29	3·36	3 32	+ 07	+ 03	
3 51	3 45	3 26	3 0ɔ	3 03	..	..	3 02	28 4	3 29	3 49	3 41	+ 20	+ 12	
3 33	3 43	3 39	3 09	2 96	.	..	2 88	28 1	3 27	3 36	3 47	+ 09	+ 20	
3 31	3 43	3 30	3 14	2·88	..		2 72	28 0	3 25	3 35	3 36	+ 10	+ 11	
3 26	3 37	3 3°	3 14	3·00	..	..	2 92	28 0	3 25	3 29	3 ɔ2	+ 04	+ 07	
37	33	39	35	40	..	..	60	1 1	·13	31	29	24	28	
3 42	3 33	3 28	3 12	3·00	..	..	2·92	28 4	3 27	3 39	3·30	+ 12	+ 0	
3 42	3 37	3 27	3 13	2 94	.	..	2 79	28 3	3 26	3 40	..	+ 14	..	
00	− 04	+ 01	− 01	+ 06	..	..	+ 13	+ 1	+ 01	− 01	.	− ·02	..	

SUBSURFACE AND MEAN VELO-

Solâni Embankment Main Site—

[*Instruments*—1⅝″ *Double-Floats*,

Serial No	1	2				3				4				5			
	Date, 1877-78	Depth			Length of Rod	Fall of Water-Surface				Wind				Timekeeper's Initial	Subsur past the ver		
		Above Datum	Actual	Variation		Upper 4 miles	1 mile below Site	Lower 4½ miles	Local Slope	From		To			(Each Velocity		
										Direction	Velocity	Direction	Velocity		Nomi		
		h	H		l	F_1	F_2	F_3	S						0	1	2
															For Series 41,		
Series 42.	21 11-'77	9·74	5 74	+ 01	5	4 79	1·21	5 35	?	..	0	SW	9	G	3 53	3 41	3 45
	8 1- „	62	62	+ ·02	5	4 71	1 19	5 30	223	..	0	W	10	P	3 37	3 33	3·26
	12 8-'76	·65	·65	00	5	5·08	1·07	5 25	218	E	10	E	12	P	3 57	3 57	3 33
	„ „	65	65	00	5	„	„	„	„	E	8	E	8	R	3 41	3 37	3 41
	„ „	65	65	00	5½	„	„	„	„	E	8	E	5	P	3 37	3 55	3·49
	19-11- „	·60	60	·00	5	4 83	1 22	5 15	213	.	0	W	8	R	3 57	3 66	3 45
	„ „	60	60	00	5'	,	1 19	5 18	„	W	8	SW	5	P	3 57	3 61	3 45
	„ „	60	60	00	5	„	1 17	5·20	213	SW	5	W	7	R	3 49	3 57	3 41
	18-11- „	57	57	00	5	4 86	1 14	5 20	200	..	0	SSE	7	P	3 57	3 49	3 49
	„ „	57	57	− 01	5	,	„	„	„	SSE	7	SE	10	R	3·30	3 49	3 26
	„ „	58	58	+ 03	5'	4 85	1 15	„	213	SE	10	SE	12	P	3 06	3 41	3 30
	13-8- „	57	57	+ 03	5	5 16	1·07	5 17	200	E	11	E	17	R	3 33	3 49	3 49
	10 1-'77	54	54	− 01	5	4 69	1 26	5 25	218	..	0	E	6	W	3 45	3 45	3·09
	„ „	55	55	+ 02	5	4 66	1·27	5 25	„	E	6	E	17	P	3 26	3 50	3 41
	1-12- „	48	48	+ 01	5	4·75	1 25	5 13	?	W	5	W	5	P	3 23	3 41	3 33
	„ „	48	48	− 01	5	„	„	„	?	W	5	S	8	G	3 30	3 23	3 13
δ	Range,	26	26	..	50	48	20	22	?023	..	..	..	..	..	51	43	40
v	Means of 16,	9 59	5 60	..	5 41	4 86	1 17	5 22	?213	SE δ E 3				..	3 40	3 46	3·36
v		Parabolic, (v)				.	.	..	..	..	..	..	..	..	3 42	3 42	3 39
Δ		Discrepancies, (v − v)				..	..	..	..	..	..	..	..	..	− 02	+ 04	− 03
Series 43.	18-1-'77	7 80	3 30	+ 01	3½	4 63	1 39	3·03	?	W δ S	9	W δ S	9	P	2 54	2 50	2 50
	„ „	80	80	00	3½	„	„	„	?	W δ S	9	W δ S	18	W	2 83	2 73	2 68
	23-1 .	·79	·79	00	3¼	4 64	1 36	4·00	3 20	..	0	..	0	P	2 48	2 50	2 50
	13-1 „	70	·70	00	3	4 63	1 37	3 90	2 33	W	4	..	0	W	2 75	2 73	2 50
	„ „	69	·69	− 02	3	4 64	„	3 89	„	..	0	S	7	P	2 78	2 63	2 54
	„ „	68	68	− 01	3	4 65	„	3 88	„	S	7	S δ E	4	W	2 54	2 6,	2 54
	22 1- „	59	59	+ 01	3'	4 54	1 36	3·90	2 20	..	0	..	0	P	2 ,8	2 46	2 59
	„ „	59	59	·00	3	„	„	„	„	..	0	S	1	W	2 59	2 59	2 50
	„ „	58	58	− 02	3½	4 55	„	3 89	„	S	9	..	0	P	2 46	2 56	2 44
	„ „	57	57	00	3½	4 56	„	3 88	„	..	0	S	6	W	2 61	2 46	2 50
	16-1- „	60	60	00	3	4 63	1 37	3 80	?	E	7	E	0	P	2 80	2 56	2 52
	„ „	60	60	00	3	„	„	„	?	E	6	E	5	W	2 68	2 75	2 73
	„ „	50	50	·00	3	„	„	„	?	E	5	E	3	P	2 54	2 59	2 46
	„ „	50	·50	·00	3	„	„	„	?	E	3	E	10	W	2 75	2 73	2 50
	15-1- „	49	49	00	3	4 64	1 36	3 80	?	SE	9	SE	10	P	2 54	2 59	2 56
	„ „	49	49	+ 01	3	„	„	„	?	SE	10	S	7	W	2 75	2 68	2 44
δ	Range,	31	31	..	30	11	03	20	?	..	..	..	.	..	43	·29	·29
v	Means of 14,	7·61	3·61	..	3 31	4·61	1 37	3 87	?	S δ E 3				..	2 66	2·61	2 53
v'		Parabolic, (v')				..	..	..	..	..	..	..	..	..	2 66	2 62	2 52
Δ		Discrepancies, (v − v')				..	..	..	..	.	..	..	..	..	00	− 01	+ 01

CITIES PAST A VERTICAL

Non Central Vertical

a d l t n Tube-Pods]

TABLE XXVI

6								7	8			9	
Fa r Velocities tical o z perim th mean three bservati ns nal D p hs								D scharge pas the vert s	Mean Veloc ty past the vertical Va ous App ox ma ns Discha ge / Dep h	A d d p h Ve oc y	Rod Ve oc y Mean of 6 rials	D fference	
3	4	5	6		5	9	10	v_H	D	U	v_{4H}	u	$(v_{4H} - U)$	$(u - U)$
SEE PAGE 56														
3 30	3 19	2 94						2 7	18	3 26	3 32	3 01	+ 06	− 25
3 49	3 26	3 06						2 94	18 4	3 28	3 45	3 00	+ 17	28
3 16	2 91	2 88						2 8(	18 1	3 20	3 19	2 9	01	41
3 6	3 16	3 09						3 04	18 3	3 25	3 20	3 06	− 05	− 19
3 9	3 41	3 4						3 4	19	3 40	3 24	3 14	16	− 26
3 57	3 53	3 49						3 4	9 8	3 54	3 55	3 23	+ 01	− 31
3 49	3 41	3 33						3 28	19 4	3 46	3 48	3 17	+ 02	− 29
3 53	3 23	3 33						3 39	19	3 42	3 5	3 23	+ 09	19
3 66	3 33	2 83						2 5	18	3 36	3 62	3 02	+ 26	− 34
3 45	3 03	2 88						2	17	3 27	3 41	3 0	+ 19	1
3 23	3 6	3 09						3 05	18 0	3 22	3 24	2 88	+ 02	− 34
3 4	3 9	3 00						3 00	18 8	3 38	3 43	3 05	+ 05	− 33
2 97	3 33	2 0						2 3	17 5	3 11	2 99	2 75	− 12	36
3 03	3 06	3 9						3 20	17 8	3 21	3 11	2 86	10	35
3 03	3 19	3 06						3 00	17 6	3 20	3 11	2 9	− 09	23
3 26	3 6	3 06						3 0	17 4	3 18	3 23	3 0	+ 05	17
69	62	79						1 10	2 4	43	63	48	42	24
3 31	3 2	3 10						3 0	18 4	3 9	3 32	3 01	+ 03	98
3 33	3 22	3 03						2 98	18 4	3 29	3 34		+ 05	
− 02	00	+ 02						+ 05	0	00	− 02		− 02	
2 54								2 5	9 6	2 5	2 50	2 49	− 01	02
2 3								2 0	9	2 56	2 68	2 44	+ 12	− 1
2 0								1 78	8·9	2 34	2 50	2 34	+ 16	00
2 42								2 36	9	2 57	2 53	2 39	04	18
2 29								2 12	9 2	2 50	2 55	38	+ 05	12
2 44								2 3	9 3	2 53	2 55	2 5	+ 02	− 02
2 42								2 02	9 0	2 51	2 57	2 34	+ 06	1
2 42								2 3	9 0	2 52	2 52	2 23	00	29
2 36								2 3	8 8	2 46	2 47	2 2	+ 01	25
2 36								2 28	8 8	2 45	2 49	2 30	+ 04	15
2 36								2 28	8 8	2 53	2 53	2 3	00	16
2 38								2 20	9 2	2 63	2 73	2 4	+ 10	− 2
2 21								2 08	8 6	2 44	2 49	2 08	+ 05	− 00
2 27								2 15	8	2 54	2 55	2 38	+ 01	16
2 36								2 26	8 8	2 5	2 57	2 52	+ 06	+ 01
2 38								2 35	8 8	2 53	2 50	2 4	− 03	11
44								73	1 1	29	26	31	20	30
2 3								2 0	9 1	2 01	2 50	2 3	+ 04	− 13
2 36								2 23	9 1	2 51	2 54		+ 03	
01								00	0	00	+ 01		+ 01	

CENTRE OF LOWEST STEP LEFT BANK
1 6 7 LEFT OF CENTRE.

SUBSURFACE AND MEAN VELO-

Solání Embankment Main Site—

[*Instruments*—$1\frac{5}{8}$" *Double-Floats,*

Series 44, 45 46.—The velocity parabola is carried down only to level of Tread of lowest Step: so that

Serial No.	Date 1877	1	2 Depth: Above Datum h	2 Depth: Actual H	2 Depth: Variation	2 Length of Rod l	3 Fall of Water-Surface: Upper 4 miles F_1	3 Fall of Water-Surface: 1 mile below Site F_2	3 Fall of Water-Surface: Lower 4 miles F_3	3 Fall of Water-Surface: Local Slope S	4 Wind: From Direction	4 Wind: From Velocity	4 Wind: To Direction	4 Wind: To Velocity	5 Timekeeper's Initial	Sub past the ver (Each Velocity Nomi 0	Nomi 1	Nomi 2
Series 44	7-4-'77	8 55	8 93	− 02	8	4 58	1 24	4 68	?	N	5	SE	10	W	2 88	2 73	2 91
	6 4 „	43	81	00	8	4·60	1 20	4 65	?	NE	6	NNE	5	P	2 86	2·91	2 84
	13-3- „	40	·78	+ 01	8	4 63	1 17	4 65	?	W	7	NE	12	W	2 91	2 80	2 83
	10-3- „	35	73	+ 04	8	4·68	1 22	3 55	?	W	7	NE	9	P	2 94	2 73	3·00
	2-4-'79	29	·65	00	8	4 54	1 26	4 50	225	W	2	..	0	A	2 54	2 78	2 65
δ	Range	26	28	.	0	14	09	1 13	?	..		.		..	40	·18	46
v	Means of 5,	8 40	8 78	.	8	4 61	1 22	4 41	?	NE b N 3				.	2 83	2 79	2 79
v'		Parabolic, (v), *down to level of 12th Step*, ...													2 82	2 82	2 76
Δ		Discrepancies, (v − v')													+ 01	− 03	+ 03
Series 45.	5-4-'77	8 19	8 57	− 04	8	4 59	1 26	4 40	220	..	0	E	21	W	2 65	2 65	2 78
	17 3- „	15	53	− 03	8	4 63	1 22	4 40	220	..	0	W	18	W	2 78	2 59	2 54
	21-3- „	12	·50	+ 04	8	4 61	1 21	4 38	?	N	7	NE	11	W	2·80	2 86	2 73
	22 3 „	·09	47	+ 02	8	4 54	1 21	4 35	?	W	9	W	13	P	2 68	2 70	2 75
	„ „	·09	47	− 02	8	„	„	„	?	W	13	W	12	W	2 68	2 75	2 73
	23-3 „	·00	38	00	8	4 63	1 20	4 27	?	W	6	W	7	P	2 63	2 63	2 40
δ	Range	19	19	..	0	09	06	13	?	..	..	..	.	..	·17	27	38
v	Means of 6,	8 11	8 49	..	8	4 59	1·22	4 36	?	WNW 4				..	2 70	2·70	2 66
v'		Parabolic, (v'), *down to level of 12th Step*, ...													2 70	2 70	2 67
Δ		Discrepancies, (v − v')													00	00	− 01
Series 46	16-3-'77	7 92	8 30	00	8	4 61	1 29	4·20	?	NW	12	NW	18	P	2 59	2 61	2 48
	19-3- „	87	25	− 03	8	4 56	1 24	4 20	?	E	7	E	2	P	2 73	2 59	2 56
	24-3- „	82	20	− 02	8	4 61	1 29	4 10	?	W	5	..	0	W	2 70	2 75	2 54
	„ „	·79	17	− 05	8	4 64	„	4·07	?	..	0	W	8	P	2 56	2 61	2 61
	29-3- „	·80	18	00	8	4 58	1 32	4 05	210	W	7	..	0	W	2 62	2 65	2 54
	31-3- „	·80	·18	+ ·03	8	4 58	1 32	4·05	?	SW	5	W	14	P	2 59	2 50	2 46
	2-4- „	74	·12	+ ·02	8	4 64	1 21	4 15	21.	..	0	E	10	W	2 70	2 56	2 63
	„ „	75	·13	·00	8	4 63	„	4 16	„	E	10	..	0	P	2 50	2 44	2 52
δ	Range	18	·18	..	0	08	·11	15	?	..	..	..	..	..	·23	31	17
v	Means of 8,	7 81	8 19	..	8	4·61	1·27	4 12	?	NNW 1				..	2 63	2 59	2 54
v'		Parabolic, (v'), *down to level of 12th Step*, ...													2 63	2 59	2 53
Δ		Discrepancies, (v − v')													00	·00	+ 01

CITIES PAST A VERTICAL. TABLE XXVII.

Non-Central Vertical

and 1" tin Tube-Rods]

the quantities r_n D U $r_{\frac{1}{m}}$ are not computed for it, not being comparable with those of the Observation Curve

6									7	8				9	
SURFACE VELOCITIES tical of Experiment. is the mean of three observations								Bed velocity	DISCHARGE past the vertical.	MEAN VELOCITY past the vertical. Various Approximations				DIFFERENCES	
										Discharge / Depth	Mid-depth Velocity.	Rod Velocity Mean of 8 trials			
nal Depths (z)															
3	4	5	6	7	8	9	10	r_n	D	U	$r_{\frac{1}{m}}$	s		$(r_{\frac{1}{m}} - U)$.	$(s - U)$
2·73	2 34	2 3[illegible]	2 33	2 36	2 27	..	..	2 19	22 4	2 51	2 36	2 34		− 15	−·17
2 63	2 46	2 36	2 40	2 42	2 33	..	..	2 26	22 [illegible]	2 53	2 42	2 33		− 11	− 20
2 63	2 50	2 42	2 34	2 48	2 38	..	..	2 30	22 5	2 56	2 47	2 40		− 09	− 16
2 54	2 38	2 59	2 47	2 29	2 21	..	..	2 15	22 1	2 53	2 46	2 43		− 07	− 10
2 56	2 34	2 44	2 38	2 52	2 46	..	..	2 42	21 9	2 53	2 37	2 31		− 16	− 22
19	·16	·23	·14	23	25	..	..	·27	0	05	11	12		09	12
2 62	2 40	2 44	2 38	2 41	2 33	..	..	2·20	22 2	2 53	2 42	2 36		− 11	−·17
2 62	2 42	..	..	..	..	..	..	..	..	..	..	..		..	..
·00	−·02	..	..	..	..	..	..	..	..	..	..	..		..	..
2 68	2 40	2 31	2 34	2 21	2 31	..	..	2 37	21 2	2 47	2 42	2 41		− 05	− 06
2 50	2 46	2 38	2 24	2 24	2 31	..	..	2 35	20 7	2 43	2 44	2 44		+ 01	+ 01
2 73	2 50	2 29	2 31	2 44	2 33	..	..	2 27	21 7	2 55	2 45	2 38		− 10	− 17
2 52	2 42	2 33	2 50	2 46	2 48	..	..	2 49	21 4	2 52	2 40	2 41		− 12	− 11
2 78	2 52	2 34	2 27	2 46	2 27	..	..	2 18	21 5	2 54	2 48	2 35		− 06	− 19
2 46	2 40	2 42	2 42	2 26	2·04	..	..	1 96	20 2	2 41	2 46	2 36		− 01	− 05
32	12	·13	·26	25	44	..	..	·53	1 5	·14	08	09		·13	·20
2 61	2 46	2 35	2 35	2 35	2 29	..	..	2 27	21 1	2 49	2 43	2 39		− 06	− 10
2 59	2 48	..	..	..	..	..	..	..	..	..	..	..		..	..
− 02	−·02	..	..	..	..	..	..	..	..	..	..	..		..	..
2 36	2 17	2 36	2 14	2 13	2 13	..	..	2 13	19 4	2 33	2 20	2 25		− 13	− 08
2 36	2 40	2 22	2 46	2 38	2 34	..	..	2 33	20 0	2 42	2 38	2 42		− 04	00
2 44	2 42	2 34	2 36	2 21	2 11	..	..	2 09	20 0	2 43	2 41	2 33		− 02	−·10
2 36	2 46	2 17	2 29	2 59	2 29	..	..	2 24	20 0	2 43	2 43	2 29		00	− 14
2 48	2 36	2 14	2 26	2 24	2 17	..	..	2 16	19 4	2 38	2 34	2 26		− 04	− 12
2 46	2·63	2 26	2 16	2 24	2 36	..	..	2 38	19 5	2 39	2 60	2 35		+ 21	− 04
2 65	2 44	2 34	2 27	2 44	2 17	..	..	2 14	20 1	2 48	2 43	2 32		− 05	− 16
2 42	2 40	2 19	2 08	2 42	2 00	..	..	1·95	19 1	2 35	2 39	2 24		+ 06	− 11
29	46	22	38	·46	36	..	..	·43	1 0	15	·40	·18		34	·16
2 44	2 41	2 25	2 25	2 33	2 20	..	..	2 18	19 7	2 40	2 40	2 31		·00	−·01
2 45	..	..	..	..	..	..	.	..	..	..	..	..		..	..
− 01	..	..	..	..	..	..	..	..	..	..	.	..		..	..

6 INCHES FROM THE 4' DROP-WALL, LEFT BANK,
i.e. 74½ LEFT OF CENTRE.

SUBSURFACE AND MEAN VELOCITIES PAST A VERTICAL. TABLE XXVIII.

Solání Embankment Main Site—Non-Central Vertical

[*Instruments*—1⅛′ *Double-Floats, and* 1″ *tin Tube-Rods*].

Serial No.	1	2				3				4				5	6				7	8		9	
	Date, 1877.	Depth.			Length of Rod.	Fall of Water-Surface.				Wind.				Timekeeper's Initial.	Subsurface Velocities past the vertical of Experiment (Each Velocity is the mean of three observations).			Bed velocity.	Discharge past the vertical	Velocity of vertical (Mean of 6 trials)		Differences	
		Above Datum.	Actual.	Variation		Upper 4 miles.	1 mile below Site	Lower 4 miles.	Local Slope.	From		To			Nominal Depths (z)								
		h	H		l	F_1	F_2	F_3	s	Direction	Velocity.	Direction.	Velocity		0	1	2	v_H	D		u	$(v_H - U)$	$(u - U)$.
Series 41.	10-4-'77	8·84	2·64	+ ·01	2	4·59	1·23	4·88		W	5	SW	1	P	2·52	2·75	2·26	1·96	6		2·43	+ ·08	− ·08
	" "	·82	·63	+ ·02	2	4·58	"	4·85		SW	1	N	9	W	2·63	2·56	2·44	2·36	6		2·59	+ ·01	+ ·08
	" "	·83	·63	+ ·01	2	"	1·22	4·90		N	9	N	8	P	2·68	2·54	2·31	2·16	6		2·50	·00	+ ·04
	" "	·83	·65	+ ·01	2	"	"	"		N	8	W	4	W	2·73	2·61	2·27	2·05	6		2·22	+ ·03	− ·25
	20-4- "	·75	·55	·00	2	4·58	1·19	4·83		SW	5	SW	2	P	2·38	2·33	2·31	2·30	6		2·41	− ·01	+ ·08
	" "	·76	·56	+ ·01	2	4·57	"	4·84		SW	9	SW	8	W	2·40	2·34	2·24	2·18	5		2·39	·00	+ ·08
	" "	·76	·56	+ ·01	2	"	"	"		SW	5	SW	9	P	2·61	2·56	2·22	2·03	6		2·22	+ ·03	− ·21
	" "	·75	·55	− ·01	2	4·58	"	4·83		SW	9	SW	7	W	2·46	2·44	2·22	2·10	6		2·21	+ ·03	− ·14
	" "	·75	·55	·00	2	"	"	"		SW	7	SW	7	P	2·63	2·31	2·05	1·96	5		2·24	− ·03	+ ·04
	21-4- "	·75	·55	·00	2	4·58	1·20	4·82		SW	7	SW	7	W	2·34	2·50	2·22	2·07	6		2·32	+ ·06	− ·14
	" "	·75	·55	·00	2	"	"	"		WSW	11	W	7	P	2·46	2·50	2·21	2·0.	6		2·21	+ ·04	− ·17
	" "	·75	·55	·00	2	"	"	"		W	7	W	8	W	2·61	2·40	2·40	2·40	6		2·38	− ·03	− ·05
	" "	·75	·55	·00	2	"	"	"		W	8	W	6	P	2·63	2·38	2·34	2·32	6		2·26	− ·03	− ·14
	" "	·75	·55	+ ·01	2	"	"	"		W	6	WSW	13	W	2·48	2·52	2·27	2·13	6		2·30	+ ·04	− ·11
	" "	·74	·54	+ ·01	2	"	"	"		WSW	13	W	7	P	2·70	2·50	2·25	2·11	6		2·27	+ ·01	− ·15
	" "	·74	·54	− ·02	2	4·59	"	4·81		W	7	SW	4	W	2·34	2·44	2·55	2·61	6		2·24	·00	− ·23
r	Range.	·11	·11	..	0	·02	·04	·09	..	..	..	..	..	..	·39	·54	·50	·65	1	·2	·35	·11	·33
v	Means of 16	8·78	2·58	..	2·50	4·58	1·20	4·84	..	W & S 5				..	2·54	2·47	2·29	2·17	6	·2	2·32	+ ·02	− ·08
v′		Parabolic, (v′) ..				..	..	..	..	..	..	..	..	..	2·54	2·47	2·29	2·14	6	·3	..	+ ·03	..
Δ		Discrepancies, (v − v′)				..	..	..	..	..	..	..	..	..	·00	·00	·00	+ ·03		1	..	− ·01	..

Centre of 9th step, Left Bank, i.e. 79½ Left of Centre

TABLES XXIX.—XXXIII.

Velocities past a Transversal.

Surface Velocities.

Solání Left Aqueduct Site,	...	Series 51, 52,	Tables XXIX.
Solaní Right Aqueduct Site,	...	Series 53 to 59,	„ XXX, XXXI.
Solání Embankment Minor Sites,		Series 60,	„ XXXIII

Mid-depth Velocities

Solání Right Aqueduct Site,	Series 61, 62,	Table XXXII.

Bed-Velocities.

Solání Right Aqueduct Site,	Series 65, 66,	Table XXXII.

In these Tables each line shows a Set of various data collected *nearly at one time*. Such Sets of similar work as were done at nearly the same water level and do not differ greatly in the velocities are grouped together into one Series.

In any one Series, the Sets done in one day follow *usually in the order of execution*, the work of different days is arranged generally by order of depth of water

The Series are numbered from 51 to 66 those done upon the same transversal at the same Site following each other (by number) by order of depth of water

The last two lines (marked δ, v, of each Series contain the following quantities for each Column, viz —

δ, "Range of (*i e.*, difference between the greatest and least of) the quantities in the column.
v, Mean of the quantities in the column.

Explanation of the Columns

Col.	Symbol	Detail.
	$\overline{b}$	Surface-Breadth
	l	Length of Connector of Double Floats (in Series 61, 62, 65, 66)
3	F_1	Fall of water-surface in upper part of the Reach.
	F_2	Fall of water surface in lower part of the Reach.
	S	Local Surface-Slope, (3 decimals, *i e.*, 000 to be prefixed by reader).
4		Direction (referred to the current axis as N S. line), and Velocity (in feet per second) of the Wind, at beginning and end of each Set.
5		Initials of the Timekeeper
6	v_y	Velocities at surface mid depth or bed, past the verticals whose distances (y) from mid channel are specified at the head of each sub-column, each entry being the mean of 3 observations
7	D	Discharge past the transversal (in sq ft. per sec), computed from the velocity-data of Col 6.
8	U	Mean velocity past the transversal computed as the quotient Discharge — Breadth.

SURFACE VELOCITIES

SOLÁNI LEFT

[*Instrument—3"*

Serial No.	1 Date, 1875	2 Depth: Central H	Depth: Variation.	Depth: Hyd Mean R	Surface-Breadth. b	Length of Connector l	3 Fall of Water-Surface: Upper 5 miles. F_1	Fall of Water-Surface: Lower 4½ miles F_2	Local Slope S	4 Wind: From Direction	From Velocity	To Direction	To Velocity	5 Timekeeper's Initial	Sun past (Each Velocity Left of 12½	00½	37½	55
Series 51.	21-1 '75	9 0	00	7 47	83 5	..	5 75	5·00	Not observed	SW	9	SSW	9	W	Assumed zero in computing Discharge.	Not observed.	3 30	3 53
	" "	05	·00	47	5	..	"	"		SSW	9	SW	9	R			3 30	3 57
	" "	05	00	47	·5	..	"	"		SW	9	SW	9	W			3 13	3 33
	22 1- "	·00	00	44	6	..	5 75	5 00		..	0	..	0	W			3 33	3 75
	" "	·00	00	44	6	..	"	"		..	0	..	0	R			3 19	3 49
	" "	00	00	44	6	..	"	"		..	0	..	0	R			3 49	3 75
	" "	00	00	·44	6	..	"	"		.	0	SW	5	W			2 94	3 26
	23 1- "	8 95	00	·41	7	..	5·75	4 85		S	2	S	4	R		2 78	3 13	3 57
	" "	·95	00	41	·7	..	"	"		S	2	SW	5	R		2 78	3 19	3 41
	" "	95	00	41	·7	..	"	"		SW	2	SW	5	W		2 83	3 13	3 41
	" "	95	00	41	7	..	"	"		SW	2	W	6	W		2 83	3 33	3 57
	23-1- "	90	00	38	·7	..	5 80	4 90		..	0	..	0	W			3 26	3·66
	" "	90	00	38	·7	..	"	"		..	0	..	0	W			3 33	3 57
	" "	90	00	·38	7	..	"	"		S	11	..	0	R			3 06	3 66
	" "	90	00	38	·7	..	"	"		S	11	S S W	11	R			2 94	3 66
δ Range,		15	..	09	·2	..	05	15	..	..	..	..	..	..	?	? 05	·55	49
v Means of 15,		8 97	..	7 42	83 7	..	5 76	4 93	..	SSW 3				..	?	?2 81	3 20	3 55
Series 52.	5-2-'75	8 90	00	7·38	83 7	..	5 70	4 90	Not observed.	W	7	S	8	R	Assumed zero in computing Discharge.	2 78	3 19	3 57
	" "	90	·00	·38	7	..	"	"		S	8	S	10	W		2 94	3 26	3 33
	" "	90	00	·38	7	..	"	"		S	15	SW	10	R		2 88	3 06	3 49
	1 2- "	·80	00	·31	9	..	5 75	4 75		SW	10	SW	12	W		2 83	3 26	3 49
	" "	80	00	31	9	..	"	"		..	0	..	0	W		3 06	3 19	3 40
	" "	80	00	·31	9	..	"	"		.	0	SW	1	W		3 00	3 33	3 57
	2-2- "	80	00	·31	9	..	"	"		SW	15	SW	15	R		2 88	3 19	3 33
	" "	80	00	·31	9	..	5 70	4 80		..	0	..	0	R		2 83	3 19	3 66
	" "	·80	00	31	9	..	5 75	"		..	0	..	0	W		2 78	3 13	3 57
	" "	80	00	·31	9	..	"	"		..	0	SE	5	R		2 88	3 33	3 33
	4-2- "	·80	00	·31	9	..	5 75	4 85		N	12	NE	10	W		2 78	3 33	3 40
	" "	·80	00	·31	9	..	"	"		N	10	NE	9	R		2 94	3 19	3 40
	" "	80	·00	·31	9	..	"	"		NE	9	SE	10	W		2 94	3 19	3 49
	6 2- "	·75	00	28	9	..	5 75	4 80		..	0	SW	12	R		2 78	3 19	3 40
δ Range,		·15	..	·10	2	..	·05	·20	..	..	..	..	.	.	?	·28	·27	33
v Means of 14		8·83	..	7·33	83·8	..	5·73	4 84	..	SSW 3				..	?	2·88	3·22	3·46

AND DISCHARGES.

TABLE XXIX.

AQUEDUCT

Surface Floats]

6															7	8
FACE VELOCITIES each vertical. (a the mean of three observations).															SURFACE DISCHARGE in sq feet per sec	MEAN SURFACE VELOCITY
centre.				Centre	Right of centre											
32½	30	20	10		10	20	30	32½	35	37½	40	41½	41⅝	42½	D	U_o
Not observed	3 80	4 29	4 17	4 35	4 22	4 29	3 95	Not observed.	3 75	3 26	2 97	Not observed.	Not observed	Assumed zero in computing Discharge	334 0	3 93
	3 90	4 17	4 50	4 35	4 35	3 90	3 85		3 66	3 26	2 86				328 1	3 86
	3 85	4 11	4 0	4 20	4 11	4 20	4 00		3 61	3 45	2 80				324 0	3 82
	•	•		•		•			3 85	3 57	3 00				340 0	4 00
	•	•		•			•		3 66	3 33	2 94				330 7	3 89
	•	•	•	•		•	•		3 85	3 41	2 73				332 6	3 91
		•	•	•			•		3 66	3 49	2 88				334 1	3 93
			•		•				3 33	3 06	3 06	2 34			322 0	3 80
		•	•	•					3 33	3 41	2 78	2 28			327 0	3 85
									3 49	3 19	2 94	2 38			327 1	3 85
									3 41	3 19	3 00	2 68			323 9	3 81
	4 00	4 17	4 48	4 29	4 29	4 17	4 11		3 75	3 41	3 06				333 5	3 92
	3 95	4 22	4 41	4 17	4 29	4 11	4 11		3 75	3 41	3 08				330 8	3 89
	3 95	4 11	4 11	4 35	4 29	4 22	3 80		3 75	3 41	2 83	Not observed			317 8	3 74
	3 70	3 85	4 11	4 11	4 05	4 05	3 80		3 66	3 41	3 00				329 9	3 88
..	52	50	44	24	50	45	49	..	52	51	33	? 40	.	?	22 2	26
..	3 91	4 15	4 31	4 24	4 24	4 14	3 99	..	3 63	3 35	2 92	2 42	..	?	329 1	3 87
3·66	3 90	4 05	4 11	4 05	4 17	4 22	3·95	3 90	3·66	3 33	3 06	2 72	2 20		323 0	3 81
3 61	3 66	4 11	4 11	4 05	3 95	3 95	3 95	3 85	3 66	3 26	2 94	2 78	2 27		318 1	3 74
3 66	3 70	4 00	4 17	4 17	4 22	3 85	3 80	3 70	3 33	3 13	2 88	2 50	2 14		315 4	3 71
3 49	3 75	4 11	4 35	4 11	4 05	3 95	3 85	3 90	3 49	3 33	2 83	2·68	2 27		320 8	3 77
3 75	3·90	4 17	4 29	4 11	4 35	4 11	4 00	3 85	3 75	3 40	3 13	2 78	2 50		326 7	3 84
3·90	4 00	4 05	4 29	4 35	4 22	4 05	4 00	3 90	3·66	3 33	2 94	2 78	2 34		329 1	3 87
3 61	3 70	4·05	3·90	4 11	4 05	4 05	3 85	3 95	3 33	3 19	2 83	2 94	1 88		319 3	3 76
4 05	4·05	4 11	4 17	4 41	4 29	4 22	4 11	4 00	4 17	3 57	3 33	2 94	2 08		336 7	3 96
3 70	3 85	4 22	4 29	4 41	4 35	4 17	4 11	4 00	3 85	3 40	3 13	2 88	2 14		334 3	3 93
3 61	3 80	4 22	4 29	4 29	4 11	4 11	4 05	4 05	3 66	3 49	3 26	2 94	2 21		330 7	3 89
3 75	3 90	4 29	4 41	4 48	4 22	4 17	4 11	4 00	3 85	3 57	3 13	2 68	2 34		338 0	3 98
3 61	4 11	4 22	4 11	4 17	4 48	4 22	4·05	3 70	3 75	3 49	3 40	3 06	2 34		331 0	3·89
3 80	3 95	4 22	4 55	4 41	4 29	4 11	3 95	3 85	3 57	3 40	3 00	2 75	2 21		333 1	3 92
3 75	3 85	4 05	4 11	4 00	4 17	4 00	3 85	3 80	3 40	3·00	3 13	2 50	2 14		316 5	3 72
56	45	29	65	48	53	37	31	35	84	57	57	56	62	?	22 0	27
3 71	3 87	4 13	4 23	4 23	4 21	4 08	3·97	3·89	3·65	3·35	3·07	2 78	2 29	?	327 7	3·84

SURFACE VELOCITIES

Solání Right

[*Instrument*—3″

AND DISCHARGES — TABLE XXX.

AQUEDUCT

Surface-Floats]

6															7	8
FACE VELOCITIES each vertical (is the mean of three observations)															SURFACE DISCHARGE in sq. feet per sec.	MEAN SURFACE VELOCITY
centre.						Centre	Right of centre									
3½	35	3½	30	20	10		10	20	30	32½	35	37½	39½	42½	D	U_o
3 95	4 38	4 55	4 69	4 69	4 61	4 84	4 44	4 41	4 08	3 87	3 75	3 51			367 7	4 33
4 35	4 55	4 69	5 00	5 00	5 13	5 03	4 84	4 88	4 05	4 00	3 61	3 57			390 2	4 59
4 32	4 38	4 84	4 88	5 00	5 00	5 10	4 84	4 88	4 32	4 05	3 82	3 41			391 0	4 61
4 22	4 48	4 41	4 92	4 69	5 17	5 00	4 76	4 44	4 41	4 05	3 90	3 57			377 7	4 44
4 29	4 61	4 76	4 65	5 17	4 92	5 00	4 92	4 84	4 48	4 11	3 85	3 41			391 1	4 60
4 08	4 17	4 58	4 58	4 84	4 61	4 61	4 44	4 22	3 87	3 77	3 61	3 53			360 6	4 24
3 80	4 48	4 41	4 72	4 55	4 65	4 51	4 35	4 22	3 77	3 66	3 66	3 41			352 1	4 14
4 08	4 44	4 22	4 32	4 48	4 55	4 39	4 26	4 08	3 90	3 75	3 68	3 30			346 0	4 07
3 97	4 05	4 41	4 35	4 51	4 55	4 41	4 32	4 22	4 00	3 64	3 43	3 33			483 3	4 10
4 11	4 17	4 38	4 61	5 00	4 72	4 76	4 58	4 26	4 11	3 75	3 61	3 33			366 7	4 31
4 41	4 48	4 46	4 58	4 80	5 00	4 72	4 48	4 22	3 97	3 97	3 51	3 45			366 0	4 31
4 29	4 61	4 55	4 48	4 76	4 72	4 35	4 44	4 17	3 95	3 90	3 66	3 26			354 8	4 17
3 77	4 4	4 44	4 69	4 61	4 41	4 80	4 51	4 32	4 08	4 00	3 90	3 61			363 0	4 27
4 29	4 29	4 44	4 61	4 76	5 00	4 80	4 48	4 26	4 00	3 66	3 53	3 26			363 6	4 28
4 08	4 26	4 38	4 69	4 44	4 26	4 76	4 51	4 22	3 84	3 73	3 64	3 37			356 0	4 19
4 35	4 55	4 84	4 92	5 26	5 36	5 00	4 69	4 55	4 30	3 90	3 70	3 61			389 5	4 58
64	56	62	68	82	1 10	78	66	80	71	47	47	35	..	?	45 5	54
4·15	4 39	4 53	4 67	4 79	4 79	4 76	4 50	4 39	4·08	3 86	3 66	3·48	..	?	367·5	4 33
										3 61	3 40	3 40	2 42	?o	330 1	3 88
										3 70	3 49	3 26	2 63	?o	330 2	3 89
										3 66	3 41	3 26	2 63	?o	329·1	3·87
										3 49	3 24	3 13	2 65	?o	325 2	3 83
30	44	·15	24	15	29	38	31	24	39	26	25	27	23	?	5 0	06
3 35	3 63	3 94	4·14	4 22	4 16	4·19	4 29	4 17	3 84	3 63	3 39	3 26	2 58	?	328 7	3 87
3·82	3 64	3 97	4 05	4 05	4 11	4 05	4 17	4 05	3 59	3 26	3 16	3·01	2 59	?o	320 9	3 78
										3 70	3 49	3 06	2 88		326 1	3 84
										3 40	3 49	3 13	2 42		317 5	3 74
										3 57	3 13	3 06	2 78		329 6	3 88
										3 80	3 19	3 19	2 78		339 7	4 00
										3 61	3 40	3 19	2 78		328 2	3 86
										3 80	3 33	3 26	2 63		328 4	3 86
										3 80	3 66	3 19	2 63		332 4	3 91
										3 70	3 49	3 06	2 83		327 2	3 85
										3 66	3 49	3 33	2 59		327 8	3 86
										3 57	3 49	3 33	2 88		313 1	3 68
										3 45	3 49	2 88	2 70		308 2	3 63
										3 37	3 13	2 88	2 59		306 3	3 60
3 13	3 49	4 05	4 05	4 22	4 17	4 00	4 05	4·00	3 61	3 57	3 33	3 13	2·88		319·3	3 76
3 40	3 49	3 61	4·05	3 90	3 90	3 95	4 05	4 11	3 66	3·61	3 57	3 26	2 88		309 9	3 65
3 26	3 57	3·95	3 95	3 90	4 11	4 29	4 22	4 11	3 61	3 53	3 49	3 26	2 94		321 8	3 79
3 40	3 49	3 85	3 95	3 80	3 95	3 95	4 05	3 95	3 85	3 70	3 49	3·06	2 88		312 1	3 67
27	35	54	47	59	75	79	41	55	48	43	53	45	52			40
3 29	3 59	3 89	3 99	4·04	4·08	4 19	4 17	4·09	3 79	3·62	3·42	3·14	2 78			3·79

Not observed — Assumed zero in computing Discharge

SURFACE VELOCITIES

Solani Right

[*Instrument*—3″

Serial No	Date, 1875-78 79	1	2 Depth. Central H	Variation	Hyd Mean R	Surface Breadth b	Length of Connector l	3 Fall of Water Surface. Upper 5 miles F_1	Lower 4½ miles F_2	Local Slope S	4 Wind From Direction	From Velocity	To Direction	To Velocity	5 Timekeeper's Initial	Assumed zero in computing Discharge.	Surface past [Each Velocity Left of 12½	41¼	41½	40
Series 57.	8 11-'78		8 62	00	7 19	84 0		6 13	4 60	230	..	0	V	9	B		2 42	3 13	3 23	
	,, ,,		62	00	19	0		,,	,,	233	V	9	NW	10	P		2 50	3·00	3 24	
	4-11- ,,		60	00	18	0	..	6 15	4 55	213	..	0	S	7	P		3 13	3 33	3 51	
	,, ,,		60	00	18	0	..	,,	,,	223	S	7	..	0	R		2 94	2 68	3 57	
	,, ,,		60	00	18	0	..	,,	,,	233	.	0	..	0	P		3 33	2 83	3 41	
	5 11- ,,		60	00	18	0	.	6 15	4 60	223	.	0	..	0	R		2 88	3 00	3 49	
	,, ,,		60	00	18	0	.	,,	,,	225	W	8	..	0	P		2 50	3 03	3 35	
	14-12 '7.		5.	+ 10	15	1	.	6 15	4 75		..	0	S	5	W		2 78	3 06	3 26	
	13 12 ,,		5.	00	15	1	.	5 9.	4 8.		.	0	V	7	H		2 88	3 13	3 19	
	,, ,,		53	- 05	13	1	..	5 97	4 83		V	7	V	7	W		2 50	3 00	3 41	
	,, ,,		50	00	11	·1		6·00	4 80	Not observed	V	7	.	0	H		2 27	3 00	3 57	
	,, ,,		·50	00	11	1		,,	,,		..	0	..	0	W		3 00	3·06	3 37	
	14 12- ,,		50	00	11	1		5 9.	4 70		..	0		0	H		2 42	3·00	3 49	
	,, ,,		50	00	11	1	.	6 20	,,		..	0	..	0	W		2 42	3 00	3 26	
	,, ,,		·50	00	11	·1	.	,,	,,		..	0	.	0	H		2 59	3 19	3 37	
	24 10 '78		50	00	11	1	.	6·50	4 30	178	..	0	.	0	R		3 80	3 49	4 17	
	δ Range,		12	..	08	1	.	55	55	?055	..	..	..	.	.	?	1 53	81	98	
	v Means of 18,		8·5.	..	7 15	84 1	..	6 12	4 66	?220	W b N 1				..	?	2 77	3·96	3 43	
Series 58.	2 4-'79		8.19	00	6 91	84 3	..	5 81	4 49	19.	..	0	..	0	Cl		2 68	3·09	3 57	
	,, ,,		·19	00	91	3	.	,,	,,	203	..	0	..	0	C		2 54	2 73	3 26	
	3 4- ,,		15	00	87	3	..	5 85	4 40	195	SW	6	V	7	Cl		2 63	2 88	3 30	
	,, ,,		16	+ 01	87	3	..	5 84	4 41	198	V	7	V	7	C		2 38	2 78	3 23	
	11-12 '75		15	00	87	3	..	6·05	4 55	?	..	0	..	0	H		2 50	2 94	3 19	
	,, ,,		15	00	87	3	..	,,	,,	?	..	0	S	8	W		2 68	3 19	3 49	
	,, ,,		·13	+ 05	86	3	..	6 07	4 83	?	..	0	..	1	W		2 88	2 77	3 16	
	,, .		10	00	84	3	.	6 00	4 50	?	..	0	.	0	H		2 27	3 13	3 33	
	5 12 '78		00	+ 01	77	4	..	6·00	4·30	19.	SW b S	3	WSW	5	A		2 54	2 97	3 19	
	15 8 ,,		7 96	- 06	74	4	.	7 24	3 96	190	..	0	SSE	5	P		3 37	3 53	3 77	
	16-8 ,,		9.	·00	73	·4	..	6 30	4 0.	188	..	0	..	0	R		3 19	3 06	3 80	
	,, ,,		9.	·00	73	·4	..	,,	,,	,,	..	0	..	0	P		3 23	3 33	3 64	
	21 10 ,,		93	00	72	4	..	6 52	3 78	200	..	0	S	5	R		3 41	4 05	3 75	
	,, ,,		92	- 03	71	4	..	6·53	3 77	190	S	5	.	0	P		3 26	3 41	3 87	
	δ Range,		27	..	20	·1	..	1 43	78	?115	..	..	..	.	..	?	1 10	1 32	71	
	v Means of 14		8·07	..	6·81	84 4		6 17	4 27	?19.	S b W 1				..	?	2 83	3 13	3 47	
59.	9 12 '75		7 70	?	6 56	84 5	..	?5 90	4 20	Not observed.	V	5	SE b E	11	H	?o	Not observed.	3 00	3 16	
	10-12- ,,		50	00	41	5	.	6 10	4 00		V	6	SW	10	R	?o		3 41	3 41	
	,, ,,		·50	00	41	5	..	,,	,,		SW	10	V	8	W	?o		3 06	3 23	
	δ Range,		20	..	·15	0	..	? 20	20	.	..	..	..	..	..	?	..	41	25	
	v Means of 3,		7 57	..	6 46	84 5	..	?6·03	4 07	..	S b W 7				.	?	..	3·16	3 27	

For Series 60, (at Solani Embankment

AND DISCHARGES — TABLE XXXI

AQUEDUCT

Surface-Floats]

6															7	8
FACE VELOCITIES each vertical (is the mean of three observations).															SURFACE DISCHARGE in sq feet per sec	MEAN SURFACE VELOCITY
centre						Centre	Right of centre									
37½	35	32½	30	20	10		10	20	30	2½	35	3 ½	39½	42½	D	U_o
3 70	3 92	4·03	4 11	4 3[illegible]	4 80	4 61	4 80	4 32	4 22	4 05	3 66	3 45	3 33		354 6	4 17
3 61	4·03	4 11	4 22	4 38	4 26	4 26	4 22	4 14	4·05	3 87	3 51	3 59	3 26		342·0	4 02
4 0[illegible]	4 22	4 44	4 80	4 58	4 58	4 55	4 55	4 89	4 41	4 44	4 20	3 87	3 61		375 8	4 42
3 92	4·00	4 20	4 48	4 44	4 [illegible]6	4 58	4 41	4 51	4 26	4 20	4 11	4 00	3 57		364 [illegible]	4 28
3 82	4·00	4 41	4 22	4 72	4 55	4 61	4 48	4 51	4 32	4 0[illegible]	3 87	3 82	3 80		367 4	4 32
3 80	4 17	4 [illegible]2	4 29	4 61	4 [illegible]	[illegible]	4 6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3 80		363 [illegible]	4 28
3 7[illegible]	4 32	4 14	4 14	4 29												4 21
3 70	3·8[illegible]	4·00	4 41	4 29												4 06
[illegible]·90	3 7[illegible]	4 00	4 11	4 13												4 00
3 [illegible]7	3 85	4 00	4 3[illegible]	4 29												4·05
3 80	3 [illegible]0	4 0[illegible]	4 22	4 22												4 00
4 11	3 80	4 11	4 35	4 41												3 98
3 90	[illegible]·53	4 11	4 41	4 17												4 00
3 49	3 80	4 00	4 29	4 35	4 [illegible]5	4 69	4 22	4 17	3 80	3 95	3 75	3 49	3 23	Assm	347 [illegible]	4 09
3·95	3 85	4 11	4 22	4 48	4 [illegible]5	4 41	4 29	4 22	3 95	3 70	3 66	3 45	3 13		347 2	4 08
4 55	4·96	5·00	5 04	5 08	5 04	5 00	4 61	4 03	3·85	3 64	3 61	3 51	3 30		379·7	4 47
1 06	1 43	1 00	93	97	8[illegible]	89	69	89	61	83	71	63	·77	?	41 5	49
3 8[illegible]	3 98	4 19	4 3[illegible]	4 42	4 51	4 49	4 38	4 31	4 06	3·9[illegible]	3 77	3 58	3 37	?	3[illegible]2 [illegible]	4 15
3 80	4 00															3 86
3 45	3 70															3 74
3 53	3 [illegible]0															3 74
3 45	3 80															3 71
3 61	3 80															4 08
3 85	4 17															3 99
3 61	3 85															4 01
3 75	4 22															4 10
3 87	4 14															4 01
4 00	4 32															4 31
4 20	4 35															4 30
4 26	4 41	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	4 29
4 22	4 69	4 72	4 88	4 55	4 72	4 72	4 61	4 08	3·80	3 80	3 68	3 64	3 49	Assm	364 [illegible]	4 29
4 41	4 69	4 88	4 [illegible]6	4 92	4 69	4 72	4 35	4 11	3 9[illegible]	3 75	3 61	3 43	3 33		368 [illegible]	4 34
96	99	1 27	1 18	1 02	81	98	91	66	56	54	40	46	43	?	53 [illegible]	63
3 86	4 13	4 18	4·33	4 39	4 36	4 38	4 2[illegible]	4·00	3 88	3·79	3 62	3 47	3 22	?	345·[illegible]	4 06
3 61	4 00	3 95	4 29	3 [illegible]6	3 75	3 8[illegible]	4 29	4 4[illegible]	4 17	3 90	3 70	3 33	3 33	?[illegible]	326 [illegible]	3 84
3 61	4 0[illegible]	4 05	4 17	4 22	4 22	4 48	4 17	4 22	4 00	3 8[illegible]	3 85	3 53	3 41	?[illegible]	344 4	4·05
3 70	3 8[illegible]	4 22	4 29	4 00	4 05	4 17	4 11	4·05	3·90	3 85	3 57	3 41	3 19	?[illegible]	330 7	3 89
09	20	27	12	56	47	63	·18	43	27	05	28	20	22	?	18 1	21
3 04	3·97	4·07	4 2[illegible]	3 96	4 01	4 17	4 19	4 2[illegible]	4·02	3·87	3 71	3 4[illegible]	3·31	?	333 [illegible]	3 93

MINOR SITES,) SEE TABLE XXXIII

MID-DEPTH AND BED VELO-

SOLANI RIGHT

[*Instrument*—1⅝"

A B.—These are velocities past a transversal a little

Serial No	1	2					3			4				5				
	Date 1876 77	Depth Central	Depth Variation	Hyd Mean	Surface Breadth	Length of Connector	Fall of Water-Surface. Upper 5 miles.	Fall of Water-Surface. Lower 4½ miles	Fall of Water-Surface. Local Slope	Wind From Direction	Wind From Velocity	Wind To Direction.	Wind To Velocity	Timekeeper & Initial.	Assumed zero in computing Discharge	Not observed	Mid-Bed past (Each Velocity Left of ½	Left of 4½	Left of 4½	Left of 40
		H		R	b	i	F_1	F_2	S											
Series 61.	16 6 '77	10 10	00	8 05	82 0	5	5 90	5 70	Not observed.	E	4	E	4	W				3 35		3 70
	25 9 „	02	09	00	0	5	6 06	5 57		..	0	V	5	G				3 49		4 11
	26 9 „	02	+ 04	·00	0	5	6 06	5 52		NNE	4	NNE	9	P				3 64		3 68
	27 9 „	02	+ 04	00	0	5	6·06	5 52		..	0	NNE	12	G				3 85		4 17
	28-9 „	02	+ 02	00	0	5	6 06	5 52		NW	4	NNE	12	P				3 73		5 97
	29 9- „	01	− 02	00	0	5	6 07	5 51		NW	3	.	0	G				3 57		4 05
	2 10 „	02	·00	00	0	5	6 06	5 52		ENE	4	ENE	7	P				3 85		4 11
	3 10- „	02	00	00	·0	5	6 06	5 52		E	4	E b N	6	G				3 49		4 11
	4 10- „	02	00	00	0	5	6 06	5 52		E	4	V	4	P				3 77		3 82
	20-6 „	00	+ 02	7 99	0	5	5 70	5 60	210	W	7	SE	11	P				3 41		3 61
	14 6 „ / 15 6- „	9 99	+ 10	98	0	5	5 76	5 67		NNE	7	NE	19	P				3 45		3 53
	12 6- „	98	+ 04	97	0	5	5 72	5 63		N	5	NE	9	P				3 26		3 75
	13-8- „	98	+ 03	97	0	5	5 97	5 53		E	5	SW	17	W				3 53		3 68
	13 6 „	96	+ 02	96	0	5	5 74	5 66		NW	7	N	6	W				3 35		3 75
	18 6 „	90	00	92	0	5	5 77	5 55		NW	7	NW	4	P				3 49		3 49
	19 6- „	·86	+ 02	90	·0	5	5 84	5 51		S	9	S	12	W				3 35		3 61
	δ Range	24	..	15	0	0	37	10	?	..	..	..	.	..	?	..		59		68
	v Means of 16	10 00	.	7 98	82 0	5	5 93	5 57	?	NE 2				..	?	..		3 54		3 82
62.	22 6 76	9 05	00	7 47	83 5	4½	5 80	4 70	?	S b W	9	SW	14	H	?o	?		3 30		3 70
65.	5-10 '77	10 00	00	7 99	82·0	10	6 08	5 50	Not observed.	E b N	6	V	8	G	?o	Not observed.		3 45		3 80
	6 10- „	00	00	99	0	10	6 08	5 50		V	7	V	7	P	?o			3 43		3 57
	8 10- „	00	00	99	0	10	6·08	5 55		E	4	N	5	G	?o			3 45		3 75
	δ Range,	00	..	00	0	0	00	05	..	..	..	..	.	..	?	..		02		23
	v Means of 3,	10 00	..	7 99	82 0	10	6 08	5 52	..	NE b E 4					?	.		3 44		3 71
Series 66	19-2 '76	8 95	+ 08	7 41	83 7	8	5 75	5 00	Not observed.	SW	4	NW	13	H	?o	Not observed.			2 97	
	18 2- „	78	+ 05	30	9	8	5 92	4 88		..	0	SSW	2	W	?o				3 14	
	21 2 „	65	00	21	84 0	8	5 75	4 75		NE	8	V	6	W	?o				2 80	
	„ „	68	+ 05	23	0	8	5 82	4 78		V	6	SW	20	H	?o				3 06	
	δ Range,	30	..	·20	3	0	·17	25	..	..	..	..	..	..	?	..		..		34
	v Means of 4,	8·77	..	7 29	83 9	8	5·81	4 55	..	SW b W 5				.	?	..		.		2 99

CITIES AND DISCHARGES

TABLE XXXII

AQUEDUCT

Double Floats in Series 61—65 *3 Double Floats in Series* 66]

above bed in d-depth or bed respectively see note XX X

6															7	8
DEPTH VELOCITIES, SERIES 61 62. VELOCITIES, SERIES 65, 66. each vertical is the mean of three observations															MEAN DEPTH OR BED DISCHARGE in sq. feet per sec	MEAN MID DEPTH OR BED VELOCITY
centre						Centre	Right of centre								D	$U_{\frac{1}{2}H}$ or U_H
37½	35	32½	30	20	0		10	20	30	32½	35	3 ½	39½	42½		
4·03	4 29	4 44	4 48	4 35	4 44	4 58	4 55	4 44	4 20	4 11	3 92	3·70	Not observed	Assumed zero in computing Discharge.	359·0	4 22
4 17	4 6	4 48	4 61	4 48	4 69	4 69	4 55	4 55	4 35	4 17	4 05	3 90			369 6	4 35
4 38	4 44	4·61	4 48	4 69	4 80	4 69	4·65	4 32	4·29	4 29	4 17	4 03			371 0	4 36
4·29	4 55	4 69	4 69	4 69	4 61	4 84	4 55	4 48	4 4	4 22	4 17	3·95			377 1	4 44
4·44	4 61	4 92	4 61	4 55	4 84	4 6	4 58	4 55	4 41	4 26	4 26	4 00			376 6	4 43
4 41	4 41	4 61	4 55	4 55	4 69	4 84	4 6	4 48	4 22	4 29	4 17	3 80			373 0	4 39
4 48	4 48	4 51	4 48	4 80	4 92	4 72	4 65	4 48	4 41	4 20	4 22	4 14			377 8	4 44
4 41	4 48	4 69	4 61	4 69	4 55	4 69	4 69	4 48	4 41	4 35	4 11	4·08			374 4	4·40
4·48	4 58	4 48	4·61	4·44	4 55	4 65	4 61	4 55	4 22	4·08	4 35	3 85			369 0	4 34
4 03	4 0	4 32	4 48	4 29	4 55	4 4	4 58	4 29	4 11	4 08	4 00	3 80			352 9	4 15
4 26	4 35	4 7	4 41	4 22	4 35	4 4									348 7	4 10
							4 44	4 22	4 08	4 14	3 80	3 64				
3 97	4·29	4 51	4 48	4 14	4 32	4 26	4 32	4 35	4 32	4 29	3 92	3 73			348 7	4 10
4 29	4 55	4 84	4 88	4 84	4 6	4·88	4· 6	4 72	4 58	4 32	4 26	3 97			386 1	4 54
4·05	4 29	4 44	4 29	4 29	4 48	4 4	4 05	4 48	4 08	4 11	3·95	3 90			355 6	4 18
4 22	4 38	4 32	4 48	4 11	4 38	4 38	4 29	4·32	4·08	4 08	3 77	3 70			348·4	4 0
4 22	4 38	4 38	4 30	4 41	4 20	4 48	4 48	4 35	4 11	3·95	3 85	3 64			354·5	4 17
51	41	75	59	73	72	62	47	50	50	40	58	50		?	37 7	44
4·26	4 43	4 53	4 56	4 47	4 57	4 61	4·55	4 44	4 27	4 18	4 06	3·86		?	360 1	4 29
4 14	4 32	4 20	4 41	4 14	4 32	4 32	4 32	4 41	4·03	4 22	3 73	3 73	3 51	?0	350	4 13
4 11	4 17	4 29	4 55	4 48	4 48	4 48	4 41	4 48	4 29	4 22	3 90	3 85	Not observed.	?0	360 8	4 24
3·90	4 41	4 29	4 44	4 26	4 65	4 48	4 58	4 35	4 14	4 29	4 17	4 03		?0	356 6	4 20
4 11	4 29	4 22	4 48	4 41	4 48	4 55	4 4	4 22	4 17	4·00	3 90	3 80		?0	3oo·4	4 18
21	24	07	11	22	17	·07	17	26	15	29	27	23		?	5 4	06
4·04	4 29	4 27	4·43	4 38	4·54	4 50	4 47	4 35	4 20	4 17	3 99	3 89		?	357 6	4 21
3 49	3 37	3 59	3·66	3 70	3 64	3 70	3 75	3 75	3 64	3 33	3 11	3 16	2 50	?0	298·	3 51
3 31	3 43	3 68	3 51	3 73	3 85	3 57	3 85	3 70	3 55	3·24	3 35	2·83	2 78	?0	29o 5	3 48
3 20	3 68	3 47	3 49	3·59	3 82	3 64	3 82	3 64	3 35	3 39	2 86	2 97	2 63	?0	291·0	3 42
3 21	3·30	3 51	3 68	3 70	3 51	3· 0	3 66	3 70	3 37	3 24	3 03	3·00	2 58	?0	294·0	3 46
29	38	21	19	14	34	13	19	11	29	15	49	33	28	?	7	09
3·30	3 40	3 56	3·59	3·68	3·71	3·65	3·7	3·70	3 48	3 30	3·09	2·9	2 69	?	294·	3·47

K

TABLE XXXIII.

SURFACE VELOCITIES AND DISCHARGES.

Solání Embankment Minor Sites

[Instrument—3″ Surface Floats]

N B —This work at two Sites of very similar Cross-Section (see Plate XXVIII) combined into one Series.

Serial No.	1	2					3		4				5	6																	7	8	9
		Depth					Fall of Water-Surface		Wind					Surface Velocities past each vertical N B The Surface Discharges computed for 168′ breadth throughout [Each Velocity is the mean of three observations]																		Surface Discharge in sq feet per sec	Mean Surface Velocity	Upper or Lower Site.
	Date 18 5	Above Datum	Variation	Central	Solání Aqueduct Gauge	Surface-Breadth.	Upper 5 miles	Lower 4½ miles	From		To		Timekeeper's Initial	Left of centre								Centre	Right of centre									
									Direction	Velocity	Direction	Velocity		64	82	80	75	70	65	60	40	20	20	40	60	65	70	75	80	82	84	D	U_s	
		h		H		b	F_1	F_2																									
Series 60.	13 1	9 70	00	10 28	9 00	168 7	5 70	4 90	SW	12	SE	10	W	2 22	3 19	3 45	3 75	4 05	4 35	4 55	4 35	4 35	4 41	4 17	4 05	3 90	3 61	3 33	3 06	2 34		684 6	4 08	Upper.
	14 1	70	00	28	·00	7	5 70	4 90	SW	12	.	0	W	2 27	3 26	3 57	3 85	4 11	4 55	4 61	4 05	4 55	4 29	4 41	4 22	4 05	3 85	3 53	3 26	2 22		707 9	4 21	
	„	68	− 03	26	8 97	7	5 73	4 92	SW	12	W	27	R	2 50	3 53	3 90	3 90	4 41	4 35	4 17	4 29	4 22	4 11	4 22	4 17	4 00	3 80	3 53	2 88	2 27		678 3	4 04	
	15-1	55	00	13	8·5	167 5	5 75	4 85	NE	12	E ð N	8	W	2 17	3 13	3 45	3 75	4 00	4 17	1 76	4 55	4 17	4 61	4 48	4 22	4 17	4 05	3 85	3 03	2 22		701 8	4 18	
	„	·55	·00	13	85	5	„	„	NE	12	S ð E	4	R	1 89	2 78	3 23	3 70	3 80	3 90	4 55	4 29	5 90	4 17	4 17	4 29	4 00	3 70	3 53	2 91	2 16		661 4	3 94	
	7-1	54	·00	17	9·5	168 7	5 75	4 95	E ð N	Λ	E ð S	Λ	R	?	2 46	3 41	3 80	3 95	4 29	4 48	4 05	4 05	4 35	4 35	4 29	4 41	3 86	3 85	3 23	?		681 0	4 05	Lower
	8-1	54	00	17	95	7	5 70	4 95	..	0	..	0	W	2 50	3 41	3 61	3 70	3 95	4 17	4 35	4 22	4 11	4 35	4 69	4 22	3 90	3 80	3 66	3 37	2 59		671 4	4 00	
	„	54	00	17	95	7	„	„	E	Λ	E	Λ	R	2 11	3 12	3 57	3 52	3 94	4 00	4 41	4 34	4 16	3 99	4 22	4 11	3 94	3 67	3 57	3 33	2 70		690 1	4 11	
	9 1	54	00	17	95	7	5 75	4 95	E	18	NE	4	R	2 13	3 09	3 45	3 66	4 00	4 11	4 29	4 41	4 55	4 41	4 55	4 29	4 17	3 85	3 75	3 19	2 56		674 6	4 02	
	„	54	·00	17	9·5	·7	„	„	E	27	E	14	W	2 33	2 97	3 57	3 85	4 05	4 05	4 17	4 17	4 35	4 05	4 29	4 22	3 95	3 66	3 53	2 86	2 22		701 0	4 17	
δ Range.		·16	.	15	15	1 2	05	·10	..	.	..	.	.	?	? 61	1 07	67	38	61	65	59	50	65	62	52	24	51	·44	52	51	? 54	?	46 5	27	
Mean of 16		9·59	.	10 19	8 94	168 4	5 73	4 92	DSD 3					?	?2 24	3 09	3 52	3 75	4-03	4 19	4 43	4 27	4 24	4 25	4 36	4 21	4 05	3 78	3 61	3 11	?2 25	?	685 2	4 08	
Assumed zero in computing D																																	

TABLES XXXIV.—LVI.

Mean Velocities and Cubic Discharges

Solání Left Aqueduct Site, ...	Series	101 to 107,	Tables XXXIV, XXXV
Solání Right Aqueduct Site, ...	„	108 to 127,	„ XXXVI—XL.
Solaní Right Aqueduct Site, with Left Aqueduct closed	„	131 to 139,	„ XLI
Solání Embankment Main Site, high water,	„	151 to 166,	„ XLII—XLV.
Solání Embankment Main Site, low water,	„	167 to 181,	„ XLVI—XLVIII
Fifteenth Mile Sites, Old Site,	„	191 to 195,	„ XLIX
Fifteenth Mile Sites, New Site,	„	196 & 197,	„ XLIX
Belra Site,	„	201 to 206,	„ L, LI
Jaolí Site,	„	211 to 217,	„ LII, LIII
Kambera Site, . .	„	221 to 225,	„ LIV, LV
Distributaries, . .	„	231 to 238,	„ LVI.

for each Column, *viz* —

δ Range of (*i. e.*, difference between the greatest and least of) the quantities in the column

v Mean of the quantities in the column

Explanation of the Columns

Col.	Symbol.	Detail
2	A H R b i B A	Area of wet section
3	F_1 F_2 F_3 S	Fall of water surface in upper part of the Reach Fall of water surface in middle part of the Reach. Fall of water-surface in lower part of the Reach Local Surface-Slope, (3 decimals, *i. e.*, 000 to be prefixed by reader)
4		Direction (referred to the current axis as N S line) and Velocity (in feet per second) of the Wind at beginning and end of each Set
5		Initial of the Timekeeper
6	u_7 H_7	each being the mean of six Soundings along a Float-Course Range of the above, *i. e.*, difference between the greatest and least of the six soundings along a Float-Course } Distributaries Table LVI
7	D	Cubic Discharge through the whole section (in cub. ft. per sec.), computed from the velocity-data of Col 6
8	V	Mean velocity through the Section, computed as the quotient Discharge — Area.
9		Average amount of Silt from surface to bed, at mid-channel, (in grains per cub ft.,) given for the Belra Site only

TABLE XXXIII.

SURFACE VELOCITIES AND DISCHARGES.

Solání Embankment Minor Sites

[*Instrument*—3″ *Surface Floats*]

N B —This work at two Sites of very similar Cross Sect on (see Plate XXVIII) combined into one series.

Serial No.	1	2					3		4		5	6																			7	8	9
	Date, 18 s	Depth: Above Datum h	Depth: Variation	Depth: Central H	Depth: Solání Aqueduct Gauge	Surface-Breadth b	Fall of Water-Surface: Upper 5 miles, F_1	Fall of Water-Surface: Lower 4½ miles, F_2	Wind: From Direction	Wind: From Velocity	Timekeeper's Initial	Surface Velocities past each vertical. N B The Surface Dis ha gd is computed for 168′ breadth throughout. (Each Velocity is the mean of three observations) Left of centre: 84	82	80	75	70	65	60	40	20	Centre	Right of centre: 20	40	60	65	70	75	80	82	84	Surface Discharge in sq feet per sec D	Mean Surface Velocity U_o	Upper or Lower Site
Series 60.	13 1	9 70	00	10 28	9 00	168 7	5 70	4 90	SW 12	SE 10	W	2 22	3 19	3 45	3 75	4·05	4 35	4 55	4 35	4 35	4 41	4 17	4 05	3 90	3 61	3 33	3 06	2 34		684 6	4 08	Upper.
	14 1	70	00	28	·00	7	5 70	4 90	SW 12	. 0	W	2 27	3 26	3 57	3 80	4 11	4 55	4 61	4 05	4 55	4 29	4 41	4 22	4 05	3 85	3 53	3 26	2 22		707 9	4 21	
	„	68	·03	26	8 97	7	5 73	4 90	SW 12	W 27	R	2 50	3 53	3 90	3 90	4 41	4 35	4 17	4 29	4 22	4 11	4 22	4 17	4 00	3 80	3 53	2 88	2 27		678 3	4 04	
	15-1	55	·00	13	85	167 5	5 75	4 80	NE 12	E b N 8	W	2 17	3 13	3 45	3 75	4 00	4 17	4 76	4 55	4 17	4 61	4 48	4 22	4 17	4 05	3 85	3 03	2 22		701 8	4 18	
	„	·55	00	13	85	5	„	„	NE 12	S b E 4	R	1 89	2 78	3 20	3 70	3 80	3 90	4 55	4 29	3 90	4 17	4 17	4 29	4 00	3 70	3 53	2 91	2 16		661 4	3·94	
	7-1	54	00	17	90	168 7	5 75	4 90	E b N h	E b S h	R	?	2 46	3 41	3 80	3 95	4 29	4 48	4 05	4 05	4 35	4 35	4 29	4 41	3 80	3 85	3 23	?		681 0	4 05	Lower
	8-1	54	·00	·17	90	7	5 70	4 90	.. 0	.. 0	W	2 50	3 41	3 61	3 70	3 95	4 17	4 35	4 22	4 11	4 35	4 69	4 22	3 90	3 80	3 66	3 37	2 59		671 4	4 00	
	„	54	00	17	90	7	„	„	E h	E h	R	2 11	3 12	3 57	3 52	3 94	4 00	4 41	4 34	4 16	3 99	4 22	4 11	3 94	3 67	3 57	3 33	2 70		690 1	4 11	
	9-1	54	·00	17	95	7	5 75	4 90	E 18	NE 4	R	2 13	3 09	3 45	3 66	4 00	4 11	4 29	4 41	4 55	4 41	4 55	4 29	4 17	3 80	3 75	3 19	2 56		674 6	4 02	
	.	·54	00	17	95	7	„	„	E 27	E 14	W	2 33	2 97	3 57	3 85	4 05	4 05	4 17	4 17	4 35	4 05	4 29	4 22	3 95	3 66	3 53	2 86	2 22		701 0	4 17	
δ Range		16		15	15	1 2	05	·10	.. ..	.. .	..	?	? 61	1 07	67	38	61	65	59	50	65	62	52	24	·51	44	52	51	? 54	?	46 5	27	
U Means of 10		9 59	.	10 19	8 94	168 4	5 73	4 92	ESE 3		..	?	?2 24	3 09	3 52	3 75	4·03	4 19	4 43	4 27	4 24	4 25	4 36	4 21	4 05	3 78	3 61	3 11	?2 25	?	685 2	4·08	

Assumed zero in computing D

Assumed zero in computing D

TABLES XXXIV.—LVI.

Mean Velocities and Cubic Discharges.

Solání Left Aqueduct Site,	... Series	101 to 107,	Tables	XXXIV, XXXV.
Solání *Right Aqueduct Site*,	... „	108 *to* 127,	„	XXXVI—XL.
Solání Right Aqueduct Site, with Left Aqueduct closed	„	131 to 139,	„	XLI.
Solání Embankment Main Site, high water,	„	151 to 166,	„	XLII.—XLV.
Solání Embankment Main Site, low water,	„	167 to 181,	„	XLVI.—XLVIII.
Fifteenth Mile Sites { Old Site,	„	191 to 195,	„	XLIX
Fifteenth Mile Sites { New Site,	„	196 & 197,	„	XLIX
Belra Site, ...	„	201 to 206,	„	L., LI
Jaolí Site, ...	„	211 to 217,	„	LII., LIII.
Kambera Site, ...	„	221 to 225,	„	LIV, LV.
Distributaries, ...	„	231 to 238,	„	LVI.

cution, the work of different days is arranged generally by order of depth of water.

238 those done at the same Site fol-

depth of water; the gaps in the num-

– Series contain the following quantities for each Column, *viz* —

δ Range of (*i. e.*, difference between the greatest and least of) the quantities in the column.
c Mean of the quantities in the column.

Explanation of the Columns

Col.	Symbol.	Detail.
2	A H R *b* *i* B A	Area of wet section
3	F_1 F_2 F_3 S	Fall of water surface in upper part of the Reach. Fall of water surface in middle part of the Reach. Fall of water surface in lower part of the Reach. Local Surface Slope, (3 decimals, *i. e.*, 000, to be prefixed by reader).
4		Direction (referred to the current-axis as N. S. line), and Velocity (in feet per second) of the Wind, at beginning and end of each SET.
5		Initial of the Timekeeper
6	v_y	Rod velocities past the several verticals whose distances (y) from mid-channel are specified at the head of each sub-column, each entry being the mean of three observations.
	H_y	Average Soundings for the several verticals whose distances (y) from mid-channel are specified at the head of each sub column, each being the mean of six Soundings along a Float-Course " Range of the above, *i. e.* difference between the greatest and least of the six soundings along a Float-Course. } given only for the Distributaries, Table LVI.
7	D	Cubic Discharge through the whole section (in cub. ft. per sec.), computed from the velocity-data of Col. 6.
8	V	Mean velocity through the Section, computed as the quotient Discharge — Area.
9		Average amount of Silt from surface to bed, at mid-channel, (in grains per cub. ft.,) given for the Belra Site only

MEAN VELOCITIES

SOLANI LEFT

[*Instruments*—*Nos* 101, 103 1″ *tin Tube Rods*,

Serial No.	Date 18 5 & 79	1	2 Depth: Central H	2 Depth: Variation	2 Depth: Hyd Mean R	2 Surface-Breadth b	2 Length of Rod l	3 Fall of Water-Surface: Upper 5 miles F_1	3 Fall of Water-Surface: Lower 4½ miles F_2	3 Fall of Water-Surface: Local Slope S	4 Wind: From Direction	4 Wind: From Velocity	4 Wind: To Direction	4 Wind: To Velocity	5 Timekeeper's Initials	Mean past (Each Velocity Left of 42½	39½	37½	35
101	14-12-'78		10·00	- ·03	7·99	82·0	9	5·9[illegible]	5·57	18[illegible]	NE	4	S	9	cl	?o	?	3·66	3·95
	19- ,,		9·87	- ·03	·91	-0	9	5·93	5·47	190	SE	[illegible]	NE	5	C	?o	3·53	3·68	3·90
	20- ,,		·83	- ·01	·92	-5	9	5·87	5·43	195	..	0	W	3	cl	?o	3·57	3·85	3·95
δ Range.			17		·08	5	0	·08	14	·01	.	.	.			?	? ·04	·19	·05
r Means of 3			9·90	..	7·94	82·2	9	5·9[illegible]	5·49	18	SE & E 1					?	3·05	3·73	3·93
Series 102	2-4-'75		9·[illegible]5	·00	7·86	82·5	9	5·[illegible]5	5·55			?0	?	?0	R				
	,, ,,		·75	·00	·86	5	9	,,			?	?0		0	W	Assumed zero in computing Discharge		3·19	3·[illegible]0
	31-3 ,,		·70	·00	·83	-5	9	5·60	5·50		.	0	?	?0	R			3·06	3·21
	,, ,,		·70	·00	·83	-5	9				?	?0		0	W			3·45	3·53
	1-4- ,,		·70	·00	·83	5	9	5·60	5·50			0	?	?0	R			3·17	3·26
	,, ,,		·70	·00	·83	5	9	,,	,,		?	?0	v	20	W			3·03	3·30
	30-3- ,,		·65	·00	·80	5	9	5·65	5·45			0		0	R			3·09	3·28
			·65	·00	·80	5	9	,,	,,		.	0		0	W			3·30	3·[illegible]0
	29-3- ,,		·50	·00	·70	5	9	5·80	5·[illegible]0			0	.	0	R			3·23	3·28
			·50	·00	·70	-5	9	,,	,,		.	0		0	W			3·23	3·26
	3-4- ,,		·50	·00	·70	5	9	5·60	5·40			0	?	[illegible]	R			3·14	3·31
	,, ,,		·50	·00	·70	-5	9	,,	,,		?	?0		0	W			3·19	3·23
δ Range.			25		·16	0	0	·25	·25	.	.	.	.	0		?	Not observed	3·30	3·23
r Means of 12.			9·63		7·79	82·5	9	5·64	5·45	.	? Calm					?		·39	·3[illegible]
Series 103.	23-5-'78		9·48	·00	7·69	82·5	9	5·9[illegible]	5·18	20[illegible]	W	6	NW	[illegible]	R	?o	3·4	3·20	
	12-4- ,,		·41	+ ·12	·65	-5	9	5·99	4·71	19	SE & S	7	NE	8	R	?o	3·5	3·75	3·66
	27-5- ,,		·40	·00	·64	-5	9	5·90	5·10	210	SW & W	8	SW	8	T	?o	3·37	3·[illegible]0	3·80
	15-4-'79		·37	+ ·03	·62	-5	8½	5·83	5·22	218	NW	[illegible]	SW	1[illegible]	n	?o	3·41	3·49	3·75
δ Range.			11		·07	0	5	·16	·51	·01[illegible]	.	.	.			?	20	3·41	3·57
r Means of 4.			9·42		7·65	82·5	8	5·91	5·05	20	SW & W 3					?	3·46	·34	·23
																		3·59	3·[illegible]0

AND CUBIC DISCHARGES. **TABLE XXXIV.**

AQUEDUCT.

No 102. $2\frac{1}{2}$" *wood Rods*]

6															7	8
VELOCITIES each vertical is the mean of three observations															CUBIC DISCHARGE in cub feet per sec	MEAN VELOCITY
centre				Centre	Right of centre											
32½	30	20	10		10	20	30	35½	35	37½	40	41½	43½	42½	D	V
4·11	4·05	4·11	4 38	4 44	4 41	4 35	4 22	4 29	4 22	4 00	4·05	3 90	3 57	?c	3,429	4·03
3 92	4 14	4 11	4 29	4 20	4 22	4 32	4 29	4 08	4 11	3 95	3 90	3·85	3 26	?c	3,409	4·04
3·90	4 11	4 38	4 41	4 29	4 41	4 11	4 22	4 14	4 22	4 22	3 80	3 59	3 23	?c	3,441	4·12
·21	·09	27	·12	·24	·19	24	07	21	·11	27	25	31	·34	?	32	·09
3 98	4 10	4 20	4 36	4·31	4 35	4 26	4·24	4 17	4 18	4 06	3 92	3 78	3·35	?	3,427	4 06
3 26	3 45	3 45	3 75	3 75											2,890	3 49
3 33	3 37	3 64	3 64	3·82											2,875	3 47
3 53	3 70	3 75	3 66	3 85											3,005	3 64
3 61	3 73	3 77	3 87	3 64											2 915	3 54
3 30	3 49	3 61	3 66	3 57	3 95	3 75	3 57	3 80	3 61	3 61	3 41	3 06			2 876	3 49
3 37	3 33	3 59	3 73	3 70	3 68	3 85	3 66	3 77	3 73	3 73	3 39	3 33			2,915	3 53
3 49	3 57	3 66	3 85	3 70	3 80	3 90	3 95	3 80	3 85	3 57	3 53	3 23			2,954	3 60
3 37	3 53	3 87	4·00	3 66	3·90	3 80	4 05	3·95	3 64	3 66	3 77	3 30			2,974	3 63
3 49	3 61	3 80	3 95	4 00	3 90	4 00	3·85	3 85	3 70	3 61	3 61	3 26			2,995	3 71
3 57	3 51	3 80	3 90	3 92	4 03	4 03	4 00	4 08	3 95	3 90	3 66	3 39			3,013	3 73
3 41	3 41	3 80	3 75	3·37	3·61	3 70	3 61	3 75	3 70	3 70	3 33	3 13			2,804	3 47
3 26	3 43	3 73	3·77	3 85	3 55	3 47	3 61	3·82	3 77	3 57	3 64	3·00	Not obser	Assumed zero in computing Discharge.	2,844	3·52
·35	·40	·42	·36	63	·50	60	48	·38	·40	·43	·44	·39	..	?	209	·26
3·42	3 51	3·71	3 79	3 74	3 76	3 76	3·76	3·82	3·71	3·64	3 50	3 21	..	?	2,922	3 57
3·85	3 77	4 11	3 95	3 75	3 85	4 00	4 20	4 17	3 97	3 85	4 03	3·55	3 19	?c	3,107	3 86
3 80	3·85	3 90	4·05	3 90	4 29	4 00	4 22	4 22	4·00	3 90	4 05	3 45	3·66	?c	3,107	3·88
3 70	3 85	4 05	4 05	4 17	4 11	4 00	4 00	4·00	4 05	3 85	3 85	3 41	3·00	?c	3,126	3·91
3 75	3 70	3 80	4·05	4·00	4 11	3·95	4 00	4 00	4 00	3·90	3 49	3 49	3·00	?c	3,034	3·82
15	15	·31	10	·42	·44	·05	·22	·22	·08	·05	·56	·14	66	?	92	·09
3·78	3 79	3·97	4 03	3 96	4·09	3·99	4 11	4·10	4·01	3·88	3·86	3·48	3·21	?	3,093	3·87

MEAN VELOCITIES

Solani Left

[Instruments—No 104 2½" wood Rods

Serial No	1 Date 1875-77 78	2 Depth Central H	Depth Variation	Depth Hyd Mean R	Surface Breadth b	Length of Rod l	3 Fall of Wate Surface Upper s mi es F_1	Fall Lower 4½ mi es F_2	Fall Local Slope S	4 Wind From Direction	From Ve oc ty	To Direction	To Ve oc y	5 T mekeeper s In t al	Mean past Each Veloc y Left of 42½	39½	37½	35
Series 104	23-3 7o	9 15	00	7 53	83 4	8½	5 65	5 1o	Not observed		0	?	?0	R	Assum d zero n compu ing Discharge	3 39	3 45	3 57
		15	00	53	4	8½				?	?0		0	W		3 37	3 49	3 53
	24 3-	15	00	53	4	8½	o 65	5 15			0	?	?0	R		3 41	3 45	3 61
		15	00	53	4	8½				?	?0		0	W		o 33	3 53	3 59
	22 3-	10	00	50	5	8½	5 60	5 10			0	?	?0	R		3 4	3 45	3 61
		10	00	50	5	8				?	?0		0	W		3 39	3 43	3 59
	25 3-	10	00	50	5	8	o 70	5 15			0	?	?0	R		3 49	3 53	3 80
	" "	10	00	50	5	8½				?	?0	N	20	W		3 43	3 63	3 61
	19 3	8 90	00	38	7	8½	5 6o	5 00			0		0	R		3 o3	3 45	3 57
	20 3	90	00	38	7	8	5 80	5 10			0	?	?0	W		3 28	3 5	3 41
	"	90	00	38	7	8				?	?0		0	R		3 3	3 6	3 61
		90	00	38	7	8½	o 90				0		0	W		3 47	3 41	3 61
	δ Range,	25		15	3	0	30	15							?	21	27	39
	v Means of 2,	9 05		7 47	63 5	8 5	5 70	5 12		? N 1					?	3 39	3 50	3 59
105	6-4 78	8 67	00	7 73	84 0	8	5 93	4 74	225	NW	?	W	5	T	?o	3 41	3 45	o 57
	?0-3	54	- 12	14	1	8	5 86	4 54	218	SW	1		0	R	?o	3 30	3 37	3 75
	δ Ra ge	13		09	1	0	07	20	007						?	11	08	18
	v M an of 2,	8 61		7 19	84 0	8	5 89	4 64	?2	W ½ N ?					?	3 36	3 41	3 66
Series 106	21 3- 78	8-19	00	6 90	85 0	7½	5 81	4-39	220	SE	3		0	T				
	12 3	00	00	77	-0	7	5 85	4 20	210	SE	6	SE	2	T	? la compuling D	3 3o	3 33	3 37
	5 3 77	00	00	77	0	7	5 90	4 30	?	S	6	V	1	P		3-06	3 19	3-33
	6 3	7 98	00	75	-0	7½	5 92	4 28	188		0		0	W		3 33	3 26	3 53
	23 ?	97	00	75	0	7	5-98	4 17	?	S	13	S	17	W		3 23	3 43	3 51
	23 3-	97	00	75	0	7½	5-83	4 27	?	V	1	V	1	P		3-06	3 o1	3 35
	δ Ra ge,	22		15	0	0	17	22	?032						?	27	24	20
	v Means of 6,	8-02		6 78	85-0	7	5 88	4 27	?200	S ½ E 4					?	3 18	3-30	3-42
Series 107	9-3- 78	7 o6	+ 02	6 46	8o-0	7	5 89	3 96	220		0	N	2	T				
	8-3- "	o3	- 03	43	0	7	5-92	3 93	22	SW	9	NW	4	R	? la compu ing D	3 23	3 30	3 33
	11 3 "	51	00	42	-0	7	5 94	3 91	23		0		0	R		3 16	3 26	3 61
	7 3-	50	00	41	0	7	5 90	3 90	22	S	6		0	T		3 19	3 37	3 37
	21 2- 77	48	00	40	0	7	6-02	3 98	?	V	9	V	9	P		3 13	3 37	3 33
	15-3- "	43	-00	-36	-0	7	5-87	3-03	?	S	4	N	7	W		2 91	3-06	3 26
	δ Range,	13		10	0	0	15	08	?015						?	3 17	3 2o	3 43
	v Means of 8,	7 o0		6-41	8o 0	7	5-92	3 94	?22	WSW 1					?	32	31	35
																3-13	3 27	3 39

AND CUBIC DISCHARGES — TABLE XXXV.

AQUEDUCT

Nos 105 *to* 107. 1" *tin Tube-Rods.*

6															7	8
VELOCITIES each vertical (is the mean of three observations)															CUBIC DISCHARGE in cub feet per sec	MEAN VELOCITY
centre				Centre	Right of centre											
32½	30	20	10		10	20	30	32½	35	8 ½	40	41½	41½	42½	D	V
3 45	3 66	3 75									3 45	3·09			2 763	3 55
3 40	3 59	3 85									3 49	3 21			2 873	3·69
3 70	3 70	3 75									3 45	3 03			2 811	3 61
3 66	3 75	3 55									3 45	3 06			2 807	3 61
3 0	3 80	3 75									3 41	?			2 747	3 63
3 66	3 80	3 77	3 90	3 90	3 66	3 75	3 77	3 75	3 68	3 66	3 51	?			2 780	3 68
3 61	3 66	3 80	3 0	3 80	3 53	3 90	3 49	3 80	3 57	3 66	3 53	3 13			2 844	3 67
3 82	3 70	3 66	3 87	3 68	3 87	3 59	3 59	3 66	3 61	3 64	3 47	3 21			2 783	3 60
3 51	3 57	3 61	3 80	3 53	3 57	3 75	3 40	3 61	3 61	3 57	3 41	?			2 671	3 53
3 68	3 77	3 61	3 68	3 85	3 70	3 75	3 64	3 57	3 64	3 57	3 31	?			2 726	3 60
3 61	3 75	3 61	3 75	3 40	3 70	3 85	3 70	3 66	3 66	3 61	3 49	?			2 731	3 61
3 66	3 57	3 77	3 73	3 77	3 85	3 55	3 66	3 68	3 64	3 59	3 59	?			2,720	3 59
37	23	30	24	·47	42	67	43	23	20	13	28	? 18		?	202	16
3 65	3 69	3 71	3 77	3 80	3·72	3 66	3 67	3 67	3 63	3 60	3 46	?3·12		?	2,771	3 61
3 85	4 05	3 80	3 80	3 95	4 00	3 90	4 00	3 85	3 90	3 53	3 53	3 2	3 00	?0	2 781	3 78
3 66	3 57	3 61	3 90	3 66	3 95	3 80	3 61	3 80	3 66	3 80	3 70	3 33	2 94	?0	2,629	3 62
19	48	19	10	29	05	10	39	05	24	27	17	10	06	?	152	16
3 76	3·81	3·71	3 80	3 81	3 98	3 85	3 81	3 83	3 78	3 67	3 62	3 28	2 97	?	2,705	3 70
								3 61	3 66	3 61	3 61	3 26	2 94		2,46	3·54
								3 66	3 80	3 41	3 50	3 13	2 94		2,377	3 50
								3 59	3 51	3 59	3 30	2 96	?		2 368	3 48
								3 37	3 31	3 37	3 13	3·08	?		2 328	3 43
								3 51	3 53	3 43	3 33	2 93	?		2 390	3 54
								3 37	3 47	3 39	3 37	3 09	?		2,227	3 34
·25	30	36	71	27	31	52	18	29	49	24	48	33	?	?	236	20
3 53	3 62	3 60	3 59	3 61	3·53	3 51	3 51	3 52	3 55	3 47	3 38	3·08	?2 94	?	2 361	3 47
3 49	3 70	3 57	3 53	3 66	3 06	3 41	3 57	3 49	3 53	3 37	3 45	3 16	3 06		2,230	3 47
3 61	3 53	3 61	3 53	3 37	3 70	3 61	3 90	3 61	3 66	3 49	3 53	3 26	3 13		2,228	3 48
3 45	3 3,	3 61	3 45	3 57	3 30	3 61	3 66	3 40	3 41	3 26	3 30	3 13	2 78		2,211	3 46
3 53	3 33	3 45	3 37	3 61	3 57	3 41	3 37	3 61	3 70	3 70	3 41	3 16	3 00		2 183	3 42
3 28	3 41	3 55	3 37	3 41	3 45	3 51	3 43	3 41	3 43	3 37	3 17	2 88	?		2 131	3 35
3 39	3 41	3 45	3·66	3 59	3 55	3 66	3 24	3 23	3 35	3 14	3 03	2 87	?		2,102	3 41
13	37	16	29	29	40	25	66	47	35	56	45	39	? 35	?	99	13
3 46	3 46	3·54	3 49	3·54	3 54	3 54	3 53	3·51	3·51	3 39	3 32	3 08	?2·99	?	2,18	3 43

Not observed

Assumed zero in computing Discharge

0 in computing D

0 in computing D

MEAN VELOCITIES

Solání Right

[*Instruments*—1″

Serial No	1	2					3			4				5				
	Date, 1876 77 78	Depth			Surface-Breadth.	Length of Rod	Fall of Water-Surface			Wind				Timekeeper a Initial	Mean past			
		Central.	Variation.	Hyd. Mean.			Upper 5 miles	Lower 4½ miles	Local Slope	From		To			(Each Velocity			
										Direction.	Velocity.	Direction.	Velocity		Left of			
		H		R	b	l	F_1	F_2	S						42½	41⅜	41½	40
Series 108.	31-5-'77	10 01	− 02	8 00	82·0	9¼	5 89	5 66	189	..	0	NE	3	W			3 41	3 64
	30-5- „	00	00	7 99	·0	9⅜	5 90	5 65	?	S	4	SSW	12	P			3 33	3 80
	1-6- „	00	00	99	·0	9⅜	5 90	5 70	?	..	0	SE	3	P			3 53	4·00
	„ „	00	00	·99	·0	9½	„	„	?	SE	3	E	11	W			3 30	3 66
	4 6- „	00	+ 02	99	0	9½	5 85	5 60	?	S	6	NE	10	P			3 30	3 70
	5-6 '76	00	00	99	0	9	5 80	5 70	185	..	0	S	5	W			3 66	4 00
	17 6- „	9 98	00	97	0	9	5 87	5 68	195	NE	6	NE	14	W		3 28	3 57	3 97
	14-6- „	·97	+ 02	97	·0	9	5 83	5 67	190	NE	6	NE	8	H		3 21	3 49	3 92
	14-12-'78	98	00	·97	0	9	5 97	5·55	175	S	9	?	?	Cl		3 13	3 31	3 75
	5-6-'77	98	00	·97	0	9½	5 82	5 58	191	SW	7	N	8	W			3 57	3 61
	6-6- „	98	00	·97	·0	9½	5·82	5 58	185	..	0	..	0	P			3 43	3 70
	7-6- „	97	00	97	·0	9½	5 83	5 57	?	NE	1	W	5	W			3 47	3 64
	„ „	97	00	97	0	9½	„	„	?	W	5	N	4	P			3 33	3 75
	8-6- „	96	+ 01	·96	·0	9¼	5 74	5 61	?	N	1	W	4	W			3 31	3 66
	„ „	97	+ 01	97	0	9½	5 73	5 62	?	W	4	S	7	P			3 26	3 64
	17-5-'76	87	− 03	90	0	9	5 83	?	180	..	0	NE	7	W			3 35	3 73
	„ „	85	00	·89	·0	9	5 85	?	„	NE	7	N	9	H			3 80	3 75
	19-12-'78	87	00	90	·0	9	5 93	5 47	200	NE	5	NE	1	C		3 06	3 19	3 68
	20-12- „	82	+ 02	·91	·5	9	5·88	5 42	205	W	4	SW	12	Cl		3 13	3 24	3 92
	δ Range,	19	..	·11	·5	5	24	28	?030	..	..	..	..	..	?	? 22	·61	39
	ν Means of 19,	9 96	..	7 96	82 0	9 3	5 85	5 61	?189	NE½E 1				..	?	?3 16	3 41	3 76
Series 109.	29-7-'78	9 68	+ 05	7 82	82 5	9	6·07	5 23	198	..	0	S½W	8	E		3 49	3 68	4 17
	2-5-'77	·65	00	·80	·5	9	5·85	4 95	?	E	7	N	18	P		?	3 41	3 49
	3-5- „	·65	00	80	·5	9	5·80	4 95	190	NE	6	..	0	W		?	3 23	3 61
	„ „	·65	00	80	·5	9	„	„	„	NE	12	N	10	P		?	3 23	3 85
	14-11- „	64	+ 02	·79	5	9	6·16	5·14	?	S	4	S	5	G		3 37	3 55	3 87
	„ „	66	+ 02	81	·5	9	6·14	5 16	?	S	5	SSW	13	P		3 57	3 57	4 08
	1-6-'76	65	− 04	80	5	9	5 85	5 45	?	S	8	NE	9	W		?	3 49	3 95
	19-11-'77	·63	00	·79	·5	9	6 07	5·28	203	V	1	..	0	G		3 53	3·68	3 90
	„ „	63	·00	79	5	9	„	„	„	V	5	NW	9	P		3 85	3 61	4 08
	15-5-'76	·63	·00	·79	5	9	5·82	5 43	185	..	0	..	0	H			3 23	3 77
	„ „	63	·00	79	·5	9	„	„	„	..	0	..	0	W			3 41	3·92
	11-5- „	·63	− 05	79	·5	9	5 82	5 43	195	..	0	..	0	W			3 19	3·68
	„ „	·58	− 05	·76	5	9	5 87	5 38	„	..	0	..	0	H			3 19	3 64
	12-5- „	·60	00	77	·5	9	5 80	5 40	190	NE	11	NE	17	W			3 39	3 80
	3-6- „	·56	−·12	75	·5	9	5 94	5·36	185	..	0	NE	10	W			3 45	3 77
	2 6- „	·52	− 04	·72	·5	9	5 73	5·32	195	E	5	NE	4	H			3 45	3·68
	16-5- „	·50	00	·70	·5	9	5·85	5 35	195	..	0	NE	10	H			3·19	3·77
	12-4-'78	51	00	·71	·5	9	5·89	4·81	190	V	12	E	22	R		3 13	3 30	3 70
	δ Range,	·18	..	·12	·0	0	·43	·64	?018	..	..	..	..	..	?	?·72	·49	·68
	ν Means of 18,	9·61	..	7 78	82 5	9	5 91	5 24	?193	NE½E 3				..	?	?3·49	3·40	3 82

TABLE XXXVI.

AND CUBIC DISCHARGES.

AQUEDUCT

(in Tube-Rods]

6															7	8
VELOCITIES each vertical is the mean of three observations).															CUBIC DISCHARGE in cub feet per sec	MEAN VELOCITY
centre						Centre	Right of centre.									
37½	35	32½	30	27½	25		10	20	30	32½	35	37½	39½	42½	D	V
3 85	3 97	4 11	3 85	3 82	4 11	4 17	3 87	4 26	4 11	3 92	3 85	3 77			3,328	3 91
3 85	4 05	4 00	4 17	4 26	4 20	4 11	4 05	4 22	4 05	3 95	3 73	3 70			3 389	3 98
3 59	3 90	4 03	4 00	4 08	4 17	4 22	4 00	4 17	4 17	4 03	3 73	3 66			3 364	3 96
3 84	3 77	3 90	3 97	4 11	4 22	3 90	4 08	4 11	4 00	3 95	3 87	3 93			3 287	3 87
3 91	3 91	4 05	4 08	4 11	3 95	4 26	4 35	4 17	4 05	3 92	3 82	3 53			3 377	3 97
4 08	4 17	4 32	4 22	3 9	4 26	4 20	4 14	3 90	3 92	4 08	3 75	3 61			3,340	3 93
4 29	4 29	4 32	4 38	4 35	4 17	4 41	4 11	4 22	4 11	4 00	3 82	3 82	3 49		3,528	4 16
4 03	4 26	4 22	3 95	4 44	4 29	4 30	4 32	3 90	4 00	3 80	3 73	3 64	3 30		3 424	4 04
4 20	4 35	4 48	4 61	4 35	4 55	4 41	4 41	4 69	4 35	4 11	4 05	3 90	3 80		3 691	4 21
3 97	4 11	4 17	4 08	4 14	4 14	4 29	3 85	4 20	3 95	3 92	3 87	3 59			3 389	3 99
3 91	4 26	4 20	4 00	4 17	4 22	4 14	3 97	4 11	4 05	3 77	3 92	3 59			3 355	3 96
3 73	4 05	4 03	4 00	4 08	4 22	4 11	4 05	4 26	3 92	3 95	3 80	3 53	Not observed		3 339	3 94
3 80	4 03	4 17	4 11	4 32	3 92	4 05	4 17	4 11	4 17	3 90	3 80	3 68			3,355	3 96
4 08	4 11	3 80	3 95	3 80	4 03	4 29	4 29	3 90	4 11	3 92	3 75	3 70			3 283	3 88
3 84	3 77	3 92	4 00	4 05	3 95	4 05	4 32	3 97	3 85	3 92	3 75	3 70			3,264	3 85
3 95	4 17	4 29	4 20	4 14	4 11	4 20	4 20	3 97	4 05	3 85	3 75	3 61			3 313	3 95
4 32	4 14	4 26	4 11	4 20	4 44	4 26	4 08	4 05	4 11	3 82	3 73	3 45			3 303	4 00
4 00	4 14	4 44	4 32	4 41	4 55	4 22	4 32	4 08	4 03	4 11	4 03	3 0	3 59		3 444	4 11
4 20	4 20	4 32	4 35	4 48	4 29	4 35	4 29	4 35	4 29	4 17	4 05	3 85	3 66		3,519	4 22
73	58	68	76	68	63	51	56	79	50	40	32	45	? 50	?	337	45
3 98	4 09	4 16	4 12	4 17	4 20	4 21	4 15	4 14	4 07	3 95	3 83	3 60	23 57	?	3,384	4 00
4 26	4 41	4 44	4 48	4 69	4 65	4 69	4 48	4 48	4 08	3 95	4 11	3 80			3,577	4 35
3 90	4 11	3 92	3 95	4 26	4 03	3 95	4 00	3 90	4 08	3 85	3 75	3 75			3 176	3 87
3 72	3 80	3 00	3 00	4 08	4 14	3 80	4 08	3 8	3 9	3 8	3 8	3 61			3 104	3 78
															3 071	3 74
															3,511	4 26
															3 425	4 17
															3 227	3 93
															3 376	4 12
															3 378	4 13
															3 15	3 86
															3 164	3 87
															3 163	3 83
															3,15	3 88
															3 130	3 84
4 00	4 03	4 05	3 97	4 00	4 14	3 92	4 08	4 20	3 87	3 85	3 64	3 47			3,141	3 87
4 08	4 17	4 00	4 20	4 38	3 95	4 05	4 14	3 80	3 80	3 73	3 66	3 45			3,14	3 89
3 90	4 14	4 05	3 90	3 97	3 90	4 05	4 00	3 82	3 82	3 80	3 57	3 49			3 064	3 79
4 05	4 17	4 17	4 35	3 95	4 00	4 05	4 17	4 00	4 17	3 90	3 70	3 75	3 85	..	3,190	3 95
58	61	54	71	84	85	89	61	68	57	59	60	69	?	?	513	61
4 02	4 11	4 13	4 13	4 18	4 14	4 16	4 17	4 04	4 02	3 86	3 77	3 59	23 85	?	3,231	3 95

Not observed. — Assumed zero in computing Discharge.

MEAN VELOCITIES

Solani Right

[*Instruments*— { *No.* 110. 1″ *wood Rods till* 8-5-'76,
No. 111. 1″ *tin Tube-*

Serial No	1	2					3			4				5				
	Date 1876 77 78 79	Depth.			Surface-Breadth	Length of Rod	Fall of Water-Surface			Wind.				Timekeeper's Initial	Mean past			
		Central	Variation.	Hyd. Mean			Upper ¼ miles.	Lower ¼ miles.	Local Slope	From		To			[Each Velocity			
										Direction.	Velocity	Direction.	Velocity		Left of			
		H		R	b	l	F_1	F_2	S						42½	41½	41½	40
Series 110.	15 4-'79	9 42	+ 05	7 65	82 5	8½ 9	5 78	5 27	200	V	4	SW	12	B		3 06	2 97	3 70
	28 5-'78	42	00	65	5	9	5 98	5 12	188	NW	4	V	4	R		3 06	3 41	3 70
	27-4-'77	41	− 02	65	5	9	5 79	5 26	?	NE	4	N	5	W		?	3 19	3 33
	„ „	42	00	65	5	9	5 78	5 27	?	NW	6	NE	4	P		?	3 16	3 37
	8 5 '76	40	00	64	5	9	5 80	5 25	200	..	0	NE	12	W		?	3 70	3 68
	3 6- „	39	− 22	63	5	9	6 11	5 19	180	NE	10	N	6	H		?	3 41	3 64
	8 8 '78	39	− 03	63	5	8½	6 21	4 94	200	..	0	..	0	R		3 33	3 75	4 35
	27-5- „	38	00	63	5	9	5 92	5 08	190	S	8	SW	13	T		3 19	3 30	3 75
	1-5-'76	33	− 05	62	8	9	5 82	5 33	190	..	0	..	0	W			3 41	3 68
	„ „	30	·00	61	83 0	9	5 85	5 30	„	..	0	..	0	H			3 53	3 68
	2-5 „	30	00	61	0	9	5 85	5 25	190	..	0	..	0	W			3 30	3 73
	„ „	30	00	61	0	9	„	„	„	..	0	..	0	H			3 30	3 61
	3 5 „	30	00	61	0	9	5 85	5 25	19	..	0	..	0	W			3 39	3 55
	„ „	30	00	61	0	9	„	„	„	..	0	..	0	H			3 23	3 47
	28 4 „	27	00	59	1	9	5 78	5 27	190	..	0	..	0	H			3 19	3 64
	29 4- „	25	00	58	1	9	5 80	5 25	190	..	0	..	0	W			3 35	3 64
	„ „	25	00	58	1	9	„	„	„	..	0	..	0	H			3 11	3 47
	„ „	25	·00	58	1	9	„	„	„	..	0	..	0	W			3 30	3 49
	„ „	25	00	58	1	9	„	„	„	..	0	..	0	H			3 16	3 57
	26-4-'77	25	00	58	1	9	5 75	5 10	180	..	0	N	10	P			3 09	3 37
δ	Range	17	..	07	6	5	46	39	?022	..	..	..	.	..	?	? 27	·78	1 02
ν	Means of 20	9 33	..	7 61	82 8	9 0	5 86	5 22	?193		N1				?	?3 16	3 31	3 62
Series 111.	15-11-'77	3 06	+ 18	7 48	83-5	8½	6 34	4 96	?	V	5	V	6	G		3 30	3 53	4 05
	25 4-'78	03	00	·46	6	8½	5 87	4 90	193	N	7	V	9	P		2 97	2 99	3 61
	20-4- „	01	00	45	6	8½	5 89	4 91	194	..	0	..	0	R		3 26	3 41	3 51
	„ „	02	00	45	6	8½	5 88	4 92	188	..	0	..	0	H		3·00	3 57	3 66
	26-4- „	00	00	·44	6	8	5 90	4 90	190	N	3	V	4	P		2·88	3 24	3 37
	12-11-'77	00	·00	44	6	8½	6 05	4 50	?	V	5	S	15	G		3 19	3 49	3 66
	15 7-'76	8 98	+ 01	43	6	8	5 92	4 98	190	..	0	E	17	H		3 11	3 61	4 05
	13-11-'77	·96	− 02	42	7	8½	6 01	4 46	182	N	8	..	0	P		3 37	3 53	3 75
	19 2-'76	90	+ 08	41	·7	8	5 75	5 00	?	SW	6	NW	12	H		?	?	3 23
	23-5- „	90	00	41	·7	8	5 85	4 95	195	..	0	SW	4	H		?	3 43	3 68
	24 5- „	·95	00	41	7	8	5 85	?	?	SE	10	NE	10	W		?	3 30	3 57
	„ „	95	00	41	7	8	„	?	?	NE	10	V	12	H		?	3 37	3 73
	25-4-'77	94	·00	40	7	8½	5 76	4 94	?	WSW	4	W	8	P		?	3 21	3 26
	„ „	94	·00	40	·7	8½	„	„	?	W	8	SW	7	W		?	2 99	3 43
	14 7- '76	90	00	·38	·7	8	5·90	4 90	200	..	0	..	0	H		3 35	3 73	3 80
	„ „	90	00	38	7	8	„	„	„	..	0	..	0	W		3 30	3 53	4 03
δ	Range	·16	..	·10	2	5	59	? 54	?023	..	..	..	.	..	?	? 49	? 74	82
ν	Means of 18	8 97	..	7 42	83 7	8 0	5·91	4 87	?190		NNW 1			..	?	3·17	?3 40	3·65

AND CUBIC DISCHARGES

TABLE XXXVII.

AQUEDUCT

and 1" tin Tube-Rods from 3-6-'76 }]
Rods }

6															7	8
VELOCITIES each vert cal is the mean of three observations]															CUBIC DISCHARGE in cub feet per sec	MEAN VELOCITY
centre							right of centre.									
3½	35	36½	30	20	10	Centre	10	20	30	32½	35	37½	39½	42½	D	V
3 66	4 11	4 00	3 90	3 90	3 80	3 85	4 11	3 90	3 95	3 90	3 85	3 75	3 57		3,047	3 82
3 90	4 17	4 05	3 87	4 29	4 17	4 17	3 90	4 32	3 82	3 97	3 70	3 59	3 57		3 223	4 02
3 53	3 53	3 57	3 70	3 85	3 77	4 00	4 14	3 82	3 77	3 85	3 59	3 41	3 43		2 9 8	3 70
3 68	3 87	3 82	3 80	3 80	3 80	3 95	4 00	3 90	3 97	3 73	3 51	3 37	3 55		2 976	3 73
4 03	4 17	4 29	4 17	3 80	4 17	4 11	4 20	3 77	3 80	3 92	3 77	3 57	?		3 067	3 83
3 92	4 00	4 08	4 05	4 14	4 03	3 80	4 05	4 08	3 82	3 75	3 53	3 31	?		3 04	3 82
4 69	4 84	4 96	4 55	4 38	4 48	4 41	4 35	4 26	3 93	3 82	4 00	3 61	3 53		3 38	4 24
4 00	3 95	4 05	4 11	4 17	4 11	4 00	4 05	4 11	4 11	3 70	3 75	3 57			3 12	3 92
4 03	4 29	4 08	4 22	4 20	4 22	4 00	4 03	3 92	3 92	3 82	3 68	3 41			3 094	3 90
3 82	4 17	4 11	4 17	4 29	4 08	4 08	4 00	3 80	3 80	3 68	3 75	3 41			3 064	3 87
2 90	4 03	3 95	4 00	4 03	4 38	3 95	3 66	3 82	3 80	3 77	3 64	3 43			2 998	3 79
3 96	4 00	4 20	4 20	4 11	4 22	4 11	4 11	4 03	3 92	3 68	3 51	3 57			3,090	3 91
3 8	3 87	4 22	3 85	4 00	4 00	3 80	4 11	4 08	3 70	3 82	3 57	3 49			3 001	3 80
3 68	3 85	4 00	4 00	3 95	4 03	4 05	3 95	4 05	3 80	3 66	3 66	3 57			3 024	3 82
3 87	4 17	4 05	4 05	3 70	3 80	4 05	4 05	3 82	3 85	3 68	3 53	3 47			2,95	3 75
3 85	4 17	4 14	3 92	4 05	3 95	3 95	3 97	3 64	3 82	3 55	3 64	3 31			2 938	3 75
3 75	4 00	4 08	3 77	4 14	3 95	3 90	3 82	3 82	3 95	3 57	3 45	3 28			2 90	3 76
3 87	4 00	4 03	4 05	4 03	3 82	3 97	4 14	3 90	3 80	3 80	3 55	3 37			2 987	3 80
3 80	3 75	4 11	4 00	4 05	4 08	3 82	4 05	3 75	3 95	3 80	3 59	3 30			2 939	3 75
3 70	3 85	3 68	3 49	4 00	3 66	3 40	3 87	3 61	3 77	3 70	3 33	3 53	3 37		2,838	3 61
1 16	1 31	1 39	1 06	68	82	71	69	71	41	42	67	47	? 20		547	63
3 88	4 04	4 09	3 99	4 04	4 03	3 98	4 03	3 92	3 86	3 76	3 63	3 47	?3 50		3,035	3 83
4 22	4 05	4 11	4 22	4 20	4 17	4 41	4 05	4 22	4 17	4 11	4 08	3 82	3 55		3 055	3 97
3 85	3 64	3 82	3 92	3 87	3 68	3 77	4 05	3 73	4 05	3 85	3 61	3 51	?		2,832	3 69
3 95	3 85	3 97	3 95	3 90	3 95	4 14	3 75	4 11	3 85	3 85	3 66	3 57	?		2 952	3 85
3 85	4 17	3 90	3 75	3 90	3 90	3 90	3 92	4 08	3 85	3 80	3 61	3 37	?		2 899	3 78
3 75	3 90	4 00	4 00	3 90	4 00	3 87	3 90	3 82	3 82	3 73	3 61	3 43	3 33		2 875	3 76
3 95	4 11	4 03	4 05	4 29	4 22	4 11	4 17	4 17	4 11	3 87	3 87	3 66	3 61		3 077	4 02
4 29	4 41	4 44	4 17	4 17	4 32	4 22	4 29	4 11	4 00	3 85	3 70	3 61	3 49		3 09	4 06
3 95	3 92	4 20	4 17	4 32	4 14	3 90	4 00	4 17	4 00	3 77	3 77	3 70	3 61		3 029	3 98
3 75	3 75	3 85	3 92	3 90	3 97	4 00	4 17	4 05	3 97	3 66	3 41	3 33	3 91		2 881	3 79
3 8	3 90	4 14	4 14	3 90	3 92	4 03	4 22	3 75	3 70	3 70	3 49	3 55	?		2 873	3 78
3 77	4 05	4 05	4 17	4 05	4 00	4 03	3 97	3 87	3 87	3 80	3 66	3 49	?		2 910	3 82
3 73	3 97	4 08	3 97	4 14	4 11	3 97	4 00	3 75	3 82	3 7	3 59	3 53	?		2 891	3 80
3 82	3 77	3 82	3 70	3 61	4 08	3 90	3 95	4 00	3 87	3 68	3 61	3 45	3 55		2 83	3 73
3 61	3 80	3 73	3 80	3 66	3 80	3 97	3 85	3 87	3 85	3 55	3 64	3 35	3 49		2 811	3 70
4 17	4 22	4 32	4 38	4 70	4 17	4 14	4 22	4 03	4 14	3 87	3 75	3 53	3 41		3 041	4 02
4 17	4 26	4 05	4 08	4 03	4 14	4 14	4 26	4 11	3 90	3 85	3 70	3 57	3 37		3,004	3 97
68	77	71	68	71	64	64	54	49	47	56	67	49	? 70	?	284	37
3 92	3 98	4 03	4 02	4 00	4 04	4 03	4 05	3 99	3 94	3 79	3 67	3 53	?3 43	?	2,941	3 66

Assumed zero in computing Discharge

Not observed

MEAN VELOCITIES

Solani Right

[*Instruments*—1″

Serial No.	1	2					3			4				5				
	Date 1876 77 78	Depth			Surface-Breadth	Length of Rod	Fall of Water Surface			Wind.				Timekeeper's Initial	Mean past			
		Central	Variation	Hyd. Mean			Upper 5 miles.	Lower 4½ miles	Local Slope	From Direction.	From Velocity	To Direction	To Velocity		Each Velocity Left of			
		H		R	b	l	F_1	F_2	S						42½	41½	41½	40
Series 112	6 4 78	8 67	00	7 23	84 0	8	5 93	4 74	19ɔ	W	3	NW	3	T		2 83	3 30	3 61
	19 4 77	66	00	22	0	8	ɔ 84	4 76		NE	4	NNE	3	P			3 26	3·39
	13 4 „	65	+ 01	21	0	8	ɔ 80	4 80		NE	7	N	21	W			3 23	3 53
	16 4 „	64	00	20	0	8	5 81	4 74		W	9	V	7	P			3 19	3 13
	„ „	64	00	20	0	8	„	„		V	7	S	17	W			3 08	3 28
	17 4 „	60	00	18	0	8	5 80	4 70		W	7	WSW	6	P			3 00	3 37
	„ „	60	− 01	18	0	8	„	„		WSW	6	W	4	W			3 11	3 41
	„ „	59	00	17	1	8	5 81	4 69		W	4	W	7	P			3 17	3 26
	„ „	59	00	17	1	8	„	„		W	7	W	5	W			3 16	3 30
	11 4 „	58	− 01	17	1	8	5 82	4 78		NE	5	SE		P			3 19	3 43
	„ „	57	− 01	16	1	8	ɔ 83	4 77		SE	9	V	10	W			3·08	3 45
	„ „	56	− 01	16	1	8	5 84	4 76		V	10	NE	7	P			3 19	3 28
	„ „	55	00	15	1	8	5 85	4 75		NE	7	S		W			3 21	3 59
	12 4 „	55	00	15	1	8	5 85	4 75		N	8	N	6	P			3 00	3 47
	10 7 78	53	00	13	1	8	5 82	4 73		S	12	SW	14	W		3 21	3 45	3 82
	13 7 „	50	00	11	1	8	5 90	4 60	220	..	0	NNE	8	H		3 01	3 31	3 77
	„ „	50	00	11	1	8	„	„	„	NNE	8	NE	5	W		3 13	3 47	ɔ 75
	20 3 „	41	− 12	06	2	8	5 99	4 41	198	WSW	5	WSW	2	E		3 13	3 19	3 53
δ Range,		26	..	17	2	0	19	39	?	..	..	..	.	..	?	? 38	47	69
ν Means of 18		8 58	..	7 16	84 1	8	5 85	4 71	?	NW ɔ W 1				.	?	?3 08	3 20	3 47
113	21-3 '78	8 16	00	6 88	84 3	7½	5 84	4 36	228	.	0	V	7	T	?ɔ	2 83	3 33	3 33
Series 114.	1 4 78	8 0ɔ	00	6 80	84 4	7	5 75	4 3ɔ	?	V	6	V	5	H		2 83	2 91	3 24
	„ „	05	00	80	4	7			?	V	5	V	8	W		2 80	2 94	3 30
	4 4 „	00	00	77	4	7	5 80	4 30	20ɔ	..	0	SSW	6	W		2 73	2 90	3 26
	„ „	00	00	77	4	7	„	„	„	SSW	6	SW	7	H		2 63	2 99	3 21
	„ „	00	00	77	4	7	„	„	„	SW	7	SW	1	W		2 68	2 97	3 41
	5-3- 78	00	00	77	4	7½	5 90	4 30	?	V	7	S	0	P		?	3·13	3 31
	6 3- „	7 98	00	7ɔ	4	7½	ɔ 99	4 28	19ɔ	N ɔ E	7	.	0	W		?	2 90	3 45
	7 3- „	98	00	7ɔ	4	7½	ɔ 92	4 28	?	V	7	S	1	P		?	3 23	3 33
	12 3- 78	98	00	7ɔ	4	7	ɔ 87	4 18	19ɔ	..	0	SE	8	T		2·89	3 16	3 26
	23-3 „	97	00	7ɔ	4	7½	5 98	4 17		S	8	S	10	W		?	2 94	3 31
	6-4- 78	98	+ 05	7ɔ	4	7	5 82	4 28		..	0	SW	5	W		2 59	3 05	3 33
	„ „	98	− 05	7ɔ	4	7	„	„		SW	5	SW	7	H		2 73	2 90	3 28
	„ „	9ɔ	00	73	4	7	5 8ɔ	4 2ɔ			0	..	0	H		2 44	2·87	3 37
	3-4- „	9ɔ	00	73	4	7	ɔ 8ɔ	4 2ɔ		W ɔ S	4	..	0	H		2 68	3 06	3 25
	5-4 „	9	00	73	4	7	ɔ 8ɔ	4 2ɔ		..	0	..	0	H		ɔ 03	3·05	3 3ɔ
	„ „	9ɔ	00	73	4	7	„	„		..	0	..	0	W		2 61	2 ,0	3 41
	„ „	9ɔ	00	73	4	7	„	„		..	0		0	H		2 42	3 01	3 14
	„ „	9ɔ	00	73	4	7	„	„		..	0	SW	11	W		2 73	2 99	3 23
	26 6- „	9ɔ	− 06	73	4	7	5 8ɔ	4 3ɔ	21ɔ	.	0	S	5	W		2 80	3 53	3 68
	„ „	89	− 07	63	4	7	5 91	4 2ɔ	„	S	5	N	1ɔ	H		2 88	3 19	3 53
δ Range,		16	..	11	0	ɔ	23	18	?015	..	.	..	.	.	?	?·61	·66	54
ν Means of 20		7 98	..	6 75	84·4	7 1	5 8ɔ	4 28	?201	SSW 3				..	?	?2 73	3 03	3 33

AND CUBIC DISCHARGES. TABLE XXXVIII.

AQUEDUCT.

in Tube-Rods]

6															7	8
VELOCITIES each vertical. (is the mean of three observations)															CUBIC DISCHARGE in cub feet per sec	MEAN VELOCITY.
centre						Centre	Right of centre									
3 ½	25	3 ½	30	20	10		10	20	30	32½	35	37½	39½	42½	D	V
3 80	4 17	4 11	3 80	4 17	4 05	4 11	4 3[illegible]	4 00	3 90	3 75	3 57	3 57	3 45		2,892	3 92
3 64	3 64	3 75	3 75	3 [illegible]0	3 80	3 77	3 8[illegible]	3 80	3 59	3 68	3 [illegible]5	3 5[illegible]	3 31		2 684	3 65
3 64	3 92	3 85	3 70	3 87	3 80	3 87	4 00	3 66	3 90	3 75	3 77	3 30	3 45		2,722	3 70
3 59	3 70	3 70	3 73	3 70	4 00	3 95	3 75	3 73	3 77	3 51	3 57	3 33	3 30		2 692	3 66
3 64	3 61	3 92	3 77	3 70	3 80	3 90	3 80	3 73	3 68	3 80	3 57	3 39	3 2[illegible]		2,689	3 66
3 [illegible]8	3 85	3 77	3 85	3 45	3 90	3 97	3 70	3 9[illegible]	3 82	3 75	3 66	3 45	3 3[illegible]		2,698	3 69
3 75	3 8[illegible]	3 87	3 82	3 75	4 08	3 90	4 00	3 77	3 68	3 80	3 66	3 49	3 43		2,718	3 72
3 55	3 70	4 00	3 80	3 45	3 85	4 08	3 66	3 70	3 73	3 77	3 64	3 43	3 39		2 674	3 66
3 68	3 73	3 77	3 77	3 82	3 82	4 00	3 85	3 85	3 77	3 59	3 70	3 3[illegible]	3 30		2,722	3 73
3 70	3 59	3 73	3 73	3 82	4 11	4 05	3 9[illegible]	3 90	3 75	3 73	3 51	3 33	3 [illegible]9		2,742	3 76
3 57	3 92	3 37	3 [illegible]0	3 80	3 57	3 59	3 87	3 85	4 00	3 66	3 64	3 53	3 49		2,661	3 66
3 51	3 64	3 82	3 49	4 00	3 70	3 92	3 87	3 90	3 75	3 8[illegible]	3 66	3 49	3 47		2,726	3 75
3 64	3 53	3 82	3 7[illegible]	3 77	3 87	3 75	3 73	3 68	3 66	3 73	3 57	3 59	3 45		2 651	3 65
3 53	3 77										3 68	3 [illegible]7	3 30		2,636	3 63
4 22	4 11										3 64	3 47	?		2,798	3 86
3 87	4 03										3 57	3 41	?		2 713	3 75
4 11	4 11										3 51	3 66	?		2 799	3 87
3 80	3 95										3 80	3 57	3 61		2,677	3 74
·71	·64	41	·65	72	54	63	69	·34	·43	·44	29	·36	? 35	?	256	·29
3·72	3 82	3·86	3·79	3 80	3·89	3·92	3 91	3·94	3 77	3·74	3 63	3 47	?3 40	?	2,716	3 73
3 80	3 75	3 61	3 90	3 9[illegible]	3 85	4 29	4 05	3·90	3 75	3 66	3 70	3 45	3 45	?0	2,66[illegible]	3 85
3 39	3 64	3 49	3 66													3 51
3 39	3 51	3 80	3 66													3 51
3 55	3 59	3 64	3 59													3 60
3 43	3 55	3 66	3 73													3 63
3 51	3 49	3 70	3 57													3 55
3 37	3 61	3 53	3 68													3 55
3 [illegible]6	3 59	3 64	3 73													3 66
3 70	3 75	3 68	3 49										3 23		2,48[illegible]	3 66
3 80	3 75	3 85	3 80										3 33		2,465	3 63
3 47	3 57	3 64	3 55										3 17		2,48[illegible]	3 67
3 55	3 57	3 75	3 75										3 06		2,381	3 51
3 47	3 49	3 66	3 68										3 00		2,374	3 50
3 70	3 59	3 68	3 66										2 91		2,4[illegible]	3 63
3 41	3 28	3 59	3 64										2 99		2 34[illegible]	3 47
3 64	3 55	3 80	3 61										2 96		2 41[illegible]	3 58
3 49	3 64	3 64	3 75										3 11		2 416	3 58
3 70	3 70	3 70	3 80										3 08		2,410	3 57
3 45	3 68	3 75	3 75	3 82	3 95	3 80	3 8[illegible]	3 80	3 49	3 55	3 51	3 23	3 16		2,461	3 64
3 97	4 00	3 95	3 87	3 75	4 00	3 95	3 85	3 92	3 80	3 66	3 70	3 33	3 17		2,544	3 76
3 77	3 92	4 03	3 85	3 70	3 66	3 92	4 00	3 80	3 68	3 61	3 68	3 53	3 16		2,487	3 71
·60	72	54	38	·53	43	50	45	·40	44	·31	·42	·36	·42	?	19[illegible]	·29
3·57	3 62	3 71	3 69	3 69	3 71	3 76	3 79	3 74	3 62	3 58	3 44	3 30	3 10	?	2,43[illegible]	3 60

MEAN VELOCITIES

Solání Right

[*Instruments*—1"

Serial No	1 Date, 1876 7 78	2 Depth. Central H	Variation	Hyd Mean R	Surface Breadth b	Length of Rod l	3 Fall of Water-Surface. Upper 6 miles F_1	Lower 4½ miles F_2	Local Slope S	4 Wind. From Direction.	From Velocity	To Direction.	To Velocity	5 Timekeeper's Initial	Mean past [Each Velocity Left of 12½	41¼	41¼	40
115	9 10 '77	7 80	00	6 63	84 4	7	6 10	4 10	1 98	.	0	..	0	G	?o	?	ɔ 21	3 85
Series 116.	27-3 '77	7 56	+ 02	6 46	84 5	7	5 84	4 01	?	N	5	NW	4	W	Zero in computing D	?	2 75	3 31
	9 3 ,,	56	00	45	5	7	5 90	3 90	203	V	1	..	0	T		2 73	3 23	3 33
	7 3 ,,	50	00	41	5	7	5 90	3 90	213	V	1	S	7	T		2 94	3 19	3 33
	8 3 ,,	50	00	41	5	7	5 90	3 90	205	NW	6	NW	1	E		3 19	3 23	3 33
	11 3 ,,	50	00	41	5	7	5 95	3 90	205	..	0	.	0	E		3 19	3 03	3 37
	21 2 '77	45	+ 06	38	5	7	6 05	3 95	?	V	9	V	9	P		?	3 05	3 31
	8 11 ,,	40	00	·34	5	7	6 05	2 90	210	V	1	V	13	G		2 94	3 00	3 41
	δ Range	16	..	12	0	0	21	1·11	?010	..	..	..	..			?	? 46	48	10
	ν Means of 7	7 49		6 41	84 5	7	5 95	3 79	?207	NW b W 1						?	?3 00	3 07	3 34
117	5 11 77	7 10	00	6 1ɔ	85 0	6½	6 00	2 60	20	E	4	N	0	G	?o	?	3 13	3 31
	21 7 '78	08	+ 05	13	0	6	6 12	3 78	230	..	0	..	0	H	?o	2 93	3·00	3·61
	δ Range,	02	..	02	0	5	12	1 18	021	..	.	..	.	..	?	?	13	30
	ν Means of 2	7·09	..	6 14	85 0	6 3	6 06	3 19	220	NE b N 2				..	?	?2 93	3 07	3 46
Series 118.	19 7- 76	6 86	− 02	5 97	85 0	6	5 99	3 56	230	..	0	NNE	7	H	Assumed zero in computing Discharge.	3 14	3 23	3 ɔ9
	14 1 '78	68	00	83	0	6	6 02	3 08	224	..	0	..	0	P		2 86	3 03	3 37
	,, ,,	69	+ 01	84	0	6	6 01	3 09	224	..	0	SW	4	G		2 88	2 99	3 31
	,, ,,	69	00	84	0	6	,,	,,	,,	S	8	S	8	P		2 88	3 06	3 39
	16-1- ,,	68	00	83	0	6	5 97	3 08	?	NW	8	S	8	G		2 63	3 09	3 39
	,, ,,	68	00	83	0	6	,,	,,	?	S	8	S	8	P		2 52	2 73	3 16
	,, ,,	68	00	83	0	6	,,	,,	?	S	9	S	10	G		2 91	2 96	3 47
	12 1- ,,	67	00	83	0	6	5 93	3 07	213	E	7	N	8	P		3 00	3 11	3 39
	,, ,,	67	− 03	83	0	6	,,	,,	,,	S	4	V	7	G		2 88	3 21	3 43
	20 7- 6	6ɔ	00	81	0	6	6 03	3 4ɔ	23(	..	0	N	1	W		2 94	3 11	3 43
	11 12 77	6ɔ	00	81	0	6	5 9ɔ	3 2ɔ	Not observed	V	5	V	4	G		2 94	3 13	3 37
	,, ,,	6ɔ	00	81	0	6	,,	,,		V	3	V	5	P		3 03	3 11	3 1ɔ
	,, ,,	6ɔ	00	81	0	6	,,	,,		V	6	SW	10	G		2 97	3 13	3 33
	17-1 '78	63	00	80	0	6	6 02	3 33		S	9	S	10	P		2 86	3 03	3 09
	,, ,,	63	00	80	0	6	,,	,,		S	10	S	1ɔ	G		2 70	3 0	3 39
	,, ,,	63	00	80	0	6	,,	,,		S	13	S	8	P		2 80	2 93	3 19
	δ Range,	23	..	17	0	0	12	49	?01ɔ	..	..	..	.	.	?	62	·50	55
	ν Means of 16,	6 67	..	5 83	85 0	6	5 99	3 21	?22	S 4				.	?	2 87	3·06	3 34
Series 119.	25 7 76	6·30	·00	5 5ɔ	85·0	6	6·40	3·10	240	..	0	..	0	H	Zero in computing D.	?	3·17	3 41
	16-10 '7ɔ	24	+ 02	50	0	5½	6 26	2·09	180	..	2	..	0	P		3 0	3 35	3 77
	24 7 76	13	+ 03	41	0	5	6 47	2 93	·70	NE	10	..	0	W		3 0(	3 19	3 73
	9 7 '78	13	+ 25	41	0	5½	6 07	2 93	31	..	0	..	0	E		3 19	3 3(	3 16
	15-10- ,,	13	− 05	41	0	5½	6 42	1 93	188	..	0	..	0	E		ɔ 30	3 ·7	3·83
	10-7- ,,	11	+ 15	40	0	5½	6·79	2 41	27	N	6	V	11	P		2·83	2 90	3 10
	26 7-'7(	·00	00	32	0	5	6·30	2 80	2ɔ(	..	0	..	0	H		3·01	3 3(	3 7(
	δ Range,	·30	..	23	0	5	·67	1 12	13	..	..	..	.		?	? 42	47	52
	ν Means of 7	6·15	..	5·43	85·0	5·4	6 53	2·61	24	NNE 1				..	?	?3·2ɔ	3·23	3·63

AQUEDUCT.

tin Tube-Rods]

6														7	8
VELOCITIES each vertical (is the mean of three observations).														CUBIC DISCHARGE in cub feet per sec.	MEAN VELOCITY
centre.						Centre	Right of centre								
37½	35	32½	30	27½	10		10	20	30	32½	35	37½	39½	40½	D	V
4·00	4 00	4 02	4 11	4 08	4 11	3 95	3 90	3 90	3 95	3 75	3 57	3 61	3 41	?o	2,561	3 86
3·66	3·64	3 68	3 80	3 23	3 70	3 68	3 64	3 73	3 59	3 61	3 37	3 13	3 16		2 126	3 49
3 61	3 57	3 57	3 53	3 66	3 61	4 00	3 75	3 90	3 75	3 66	3 45	3 26	2 97		2 349	3 66
3 70	3 57	3 49	3 66	3 76	3 75	3 57	3 80	3 66	3 70	3 49	3 37	3 33	3 16		2 256	3 53
3 45	3 70	3 66	3 57	3 80	3 76	3 80	3 70	3 70	3 66	3 41	3 49	3 33	3 26		2,236	3 60
3 49	3 61	3 66	3 53	3 66	3 95	3 90	3 95	3 61	3 70	3 45	3 53	3 45	3 23		2,306	3 62
3 49	3 68	3 66	3 70	3 85	3 95	3 85	3 75	3 82	3 49	3 47	3 39	3 41	3 03		2,326	3 57
3 61	3 61	3 85	3 70	3 73	3 82	3 75	3 97	3 68	3 47	3 49	3 53	3 35	3 19		2,269	3 61
25	13	36	27	62	34	·43	33	·29	28	·25	·16	32	29	?	223	·17
3 57	3 63	3 65	3 64	3 66	3 78	3 79	3 79	3 73	3 62	3 51	3 45	3 32	3 14	?	2,275	3 59
3 59	3 70	3 80	3 77	3 80	3 53	3 80	3 95	3 61	3 41	3 47	3 41	3 47	2 97	?o	2,172	3 60
3 80	3 85	4 05	4·08	3 92	3 95	3 82	3 95	3 80	3 61	3 59	3 39	3 39	3 16	?o	2,245	3 73
·21	·15	25	31	·12	42	02	00	19	20	12	02	08	19	?	73	·13
3 70	3 78	3 93	3 93	3 86	3 74	3 81	3 95	3 71	3 51	3 53	3 40	3 43	3·07	?	2,208	3 67
										3 68	3 45	3 45	3 00		2,154	3 70
										3 53	3 43	3 24	2 97		2,004	3 53
										3 37	3 31	3 26	3 08		2,090	3 55
										3 51	3 43	3 16	2 96		2 021	3 55
										3 47	3 41	3 23	2 84		2,042	3 60
										3 35	3 33	3 06	2 91		2,01	3 54
										3 51	3 47	3 45	3 17		2 01	3 56
										3 51	3 49	3 26	2 93		2 044	3 61
										3 49	3 43	3 31	2 99		2 057	3 63
										3 53	3 33	3 17	?		2 02	3 59
										3 66	3 45	3 24	3 09		2 030	3 59
										3 59	3 59	3 23	2 99		2 077	3 67
										3 55	3 49	3 23	3 03		2 031	3 59
3 64	3 47	3 61	3 77	3 68	3 85	3 75	3 85	3 57	3 53	3 43	3 47	3 31	3 01	Assumed zero in computing Discharge.	2,00	3 57
3 43	3 53	3 66	3 73	3 66	3 75	3 82	3 77	3 68	3 73	3 39	3 39	3 21	2 99		2,010	3 58
3 41	3 55	3 59	3 61	3 77	3 65	3 82	3 57	3 73	3 57	3 57	3 41	3 49	2 83		2,024	3 59
44	50	42	52	21	·57	40	38	36	24	33	28	43	? 34	?	155	17
3 61	3 65	3 66	3 70	3 73	3 75	3 76	3 74	3 70	3 62	3 51	3 43	3 27	?2 99	?	2,034	3 59
3 66	3 82	3 77	3 80	3 66	3 77	3 77	3 57	3 66	3 45	3 49	3 19	3 19	2 91		1,908	3 56
3 92	3 97	4 17	3 95	4·00	4 17	3 82	3 90	3 61	3 61	3 45	3 43	3 23	3 21		1 974	3 72
3 95	3 97	4 03	4 03	3 97	4 00	4 00	3 97	3 82	3 68	3 73	3 33	3 24	3 16		1,977	3 79
3 95	4 05	4 11	4 29	4 29	4 29	4 00	4 22	4 22	4 22	4 00	3 95	3 90	3 55		2,107	4 04
3 85	3 95	4 03	3 90	4 05	4 11	4 03	3 77	3 68	3 59	3 49	3 35	3 23	3 09		1 96	3 77
3 55	3 53	3 45	3 75	3 75	3 80	3·87	3 63	3 75	3 68	3 55	3 53	3 41	3 23		1 88	3·63
3 66	3 73	3·87	3 87	3 92	3 8,	3 75	3 75	3 73	3 55	3 49	3 31	3 28	2 91		1,864	3 65
·40	·52	72	54	63	52	28	65	61	79	55	·76	71	64	?	243	·48
3 79	3 86	3·92	3·94	3 95	4 00	3·89	3·84	3·78	3 68	3 60	3·44	3·35	3·15	?	1,954	3·74

MEAN VELOCITIES

SOLANT RIGHT

[*Instruments*—Nos 120 to 126 1" tin Tube Rods

Series No	1 Date 1876 77 78	2 Depth: Central H	Variation	Hyd Mean R	Surface-Breadth b	Length of Rod l	3 Fall of Water-Surface: Upper f m	Lower f m	Local Slope S	4 Wind: From Direction	From Velocity	To Direction	To Velocity	5 Taken per sfn	Mean past [Each Velocity Left of 42½	4½	4	40
120	13-10-7	3 93	+ 05	3 96	80 0	5	5 77	1 93		SSW	4	SSW	4	P		?	2 69	3 03
		86	+ 08	91	0	5	5 84	1 86		S	4	SSW	4	G		?	2 73	2 86
		8	00	90	0	5	5 80	1 80		S	5	S	10	P		?	2 65	2 94
		84	+ 03	19	0	5	3 81	1 84		V	1	S		G		?	2 5	2 9
	23-1		00	19	0	5	3 90	?		E	4	E	4	G		2 59	2 2	3 13
	19-10-	7	00	14	0	5	3 93	? 47		NE	4	V	5	G		?	2 63	2 9
		6	0	13	0	5½	3 94	? 46		V	5	S	6	P		?	2 9	2 9
		6	05	0	0	5	3 97	2 33		E	5	WSW	1	G		?	2 86	3 6
		6	+ 05	0	0	5				WSW	10	WSW	5	P		?	2 90	3 2
	δ Range	30		24	0	5	20	9								?	?	27	35
	v Means of 9	3 8		5 14	80 0	3 9	3 89	? 90		SSW 3						?	?? 09	? 3	3 09
121	14 10-	5 63	00	5 0	80 0	5	6 1	1 3	180		0		0	R		?0	2 8	2 99	3 28
	27	3 8	05	4 98	0	5	6 3	3 08	300		0	S	6	V		?0	2 90	2 99	3 46
	δ Range	05		04	0	0	15	1 55	120							?	12	00	17
	v Means 2	5 61		5 00	80 0	5	6 3	? 31	24		S ?					?	? 84	? 90	3 3
122	?? 12-	4 7	00	4 17	80 0	4	5 63	1		E	8	V		P			2 50	2 48	2 68
		57	00	17	0	4				V	5	S		G			2 24	2 42	2 59
		7	00	1	0	4				S	9	S		P			2 38	2 42	2 6
		3	00	1	0	4				S	9	S		G			2 40	2 30	2 67
		5	00	17	0	4		"		S	8	V		P			2 40	2 40	2 8
		3	00	1	0	4	3 68			V	7	S		G			2 33	2 4	2 56
	24 12	40	+ 03	10	0	4	3 61	1 9	19		0	S		P			2 34	2 33	2 6
		4	+ 05	07	0	4	3 6	1 3	19	S b W			0	G			2 24	2 34	2 55
		40	00	03	0	4	3 68	1 0	?	S	6	S b W		P			2 3	2 33	2 62
	19-12	40	00	03	0	4	3 63	1 0	218	SW	4	S	10	G			2 11	2 35	2 48
	23 8-	8 43	+ 05	0	0	4	6 37	? 93	24	N	7	E	6	P			2 2	2 5	2 8
		3	+ 05	3 99	0	3½	6 0	1 93	96		0	N		R			2 8	2 6	3 03
		6 33	00	97	0	4	6 87	?1 73	83	S	6	SE	4	H			?	2 86	3 05
	δ Range	24		20	0	5	1 26	?53	?135							?	? 39	56	57
	v Means 2 1	4 48		4 10	80 0	4 0	5 8?	?1 81	?? 3	S b E 3						?	?? 33	? 46	? 0
123	1 10-7	3 6	00	3 40	80 0	3	4 0	0	?		0		0	G		?0	?	6	62
124	31 6	3 40	− 1?	3 6	80 0	3	6 61	1 9	19		0	V		W		?0	?	2 20	2 32
125	16- 8	0	− 04	1 0	80 0	1½	7 8	4	?0	S	1	S		P		?0	1 23	1 36	45
126	11 6	1 0	− 24	1 8	80 0	1½	3 93	? − 38	?	S	6	S	5	R		?0	1 03	1 6	1 12
127	11 7 8	0	0	0	84	1	7 40	?	113	S	11	S	8	P		?0	4	5	66

AQUEDUCT

No 127 1" *wood Rods*]

6														7	8
VELOCITIES each vertical (a the mean of three observations)														CUBIC DISCHARGE in cub feet per sec	MEAN VELOCITY
centre.							Centre	R ght of centre.							
3 1	35	3·1	30	20	10		10	20	30	3 1	35	3 1	39 1 42½	D	V
3 17	3 30	3 16	3 00	3 17	3 23	3 28	3 33	3 35	2 93	3 11	3 01	2 83	2 80	1 57	3 13
3 06	3·08	3 13	3 13	3 05	3 26	3 35	3 23	3 3	3 13	3 14	3 14	2 86	2 80	1 5o	3 12
3 26	3 19	3 08	3 03	3 26	3 01	3 35	3 9	3 41	3 30	3 11	3 06	3 05	2 82	1 582	3 18
3 03	3 19	3 26	3 19	3 37	3 23	3 26	3 37	3 37	3 30	3 30	3·06	2 73	2 73	1,583	3 19
3 4	3 61	3 64	3 3	3 57	3 70	3 66	3 61	3 57	3 24	3 37	3 33	3 11	2 88	1 69o	3 46
3 30	3 53	3 33	3 37	3 30	3 09	3 o7	3 37	3 4	3 41	3 33	3 13	3 o3	2 97	1 60	3 27
3·06	3 30	3 37	3 08	3 17	3 19	3 33	3 59	3 28	3 19	3 26	3 14	2 99	3 01	1 55o	3 8
3 26	3 4o	3 4[illegible]	3 49	3 45	3 45	*3 33*	*3 53*	3 37	*3 26*	*3 16*	3 13	2 80	2 88	1 56o	3 27
3 30	3 41	3 39	3 2o	3 35	3 28	3 24	3 o9	3·43	3 26	3 23	3 14	3 00	3·03	1 550	3 24
44	53	56	73	52	69	42	42	34	48	26	32	60	30	?	143	34
3 21	3 34	3 31	3 25	3 30	3 27	3 3o	3 40	3·38	3 22	3 22	3 13	2 97	2 88	?	1 584	3 23
3·47	3 57	3 53	3 53	3 70	3 66	3 39	3 55	3 45	3 45	3 33	3 16	3 06	2·8o	?o	1 6?	3 40
3 4	3 53	3 55	3 53	3 64	3 55	3 75	3 59	3 49	3 28	3 31	3 09	2 94	2 82	?o	1 639	3 46
06	04	02	00	06	11	36	04	04	17	02	07	12	01	?	12	06
3 44	3·55	3 54	3 o3	3·67	3·61	3 57	3 o7	3·47	3 37	3 32	3 13	3 00	2 83	?	1 63o	3 43
2 69	2 8	2 75	2·82	2 88	2 93	2 90	2 6	2 86	2 79	2 8	2 65	2 58	2 31		1 076	2 77
2 72	2 88	2 97	3 16	2 88	2 88	2 86	3·03	2 91	2 91	2 86	2 75	2 60	2 26		1 092	2 81
2 78	2 83	2 91	2 94	3 06	2 99	3·06	2 87	2 96	2·94	2 79	2 80	2 53	2 30		1 120	2 88
2 75	2 83	2 86	2 8	2 97	3 08	2 91	3·05	2 91	2 86	2 90	2 73	2 62	2 34		1 099	2 83
2 84	2 79	2 90	2·90	2 99	2 87	3 01	2 94	2 91	2 6	2 80	2 69	2 60	2 43		1 104	2·84
							3 06	2 94	2 80	2 65	2 91	2 69	2 27		1 102	2 84
							2 74	2 86	2 60	2 61	2 53	2 35	2 17		1 02	2 69
							2 86	2 84	2 53	2 73	2 o	2 62	2 10		1 030	2 72
							2 80	2 8	2 61	2 6	2 60	2 46	2 22		1 031	2 74
							2 83	2 97	3 00	2 87	2 84	2 67	2 45		1 024	2 74
							3 39	3 39	3 16	3 14	2·93	2 82	2 62		1 21	3 24
							3 53	3 45	3 28	3 13	3 06	2 96	2 60		1 23	3 35
3 23	3 4	3 16	3 13	3 39	3 53	3 37	3 55	3 41	3 57	3 41	3 30	3 16	3 14	Assumed zero in computing Discharge	1 214	3 30
70	92	90	91	·83	90	75	·81	·61	1 04	80	77	·81	1 04	?	213	66
2·83	2 92	2 96	2 96	2 99	3 02	3 o3	3 03	3 02	2 91	2 88	2 81	2 67	2 40	?	1 106	2 90
70	65	69	68	67	73	72	8	78	76	75	72	73	63	?o	218 9	71
2 44	2 6	2 53	2 46	2 4	2 53	2 60	2 65	2 52	2 44	2 21	2 25	2 1	2 03	?o	722 ?	2 43
1 43	1 49	1 58	1 46	1 46	1 55	1 65	1 90	1 88	1 84	1 76	1 71	1 60	1 43	?o	? 6 ?	1 61
1 21	1 17	1 19	1 21	1 21	1 16	1 20	1 35	1 46	1 42	1 38	1 24	1 1	99	?o	?02 8	1 24
55	58	53	53	54	56	57	66	,	78	·67	65	49	44	?o	3o·[illegible]	·60

MEAN VELOCITIES

Solání Right Aqueduct,

[*Instrument*—1″

Serial No	1	2					3			4				5				
	Date 1876-77 78	Depth. Central	Variation	Hyd Mean	Surface-Breadth	Length of Rod	Fall of Water-Surface. Upper 6 miles.	Lower 4½ miles.	Local Slope	Wind From Direction.	From Velocity	To Direction	To Velocity	Tmekeeper's Initial	Mean past [Each Velocity Left of			
		H		R	b	l	F_1	F_2	S						42½	41½	41¼	40
131	27 10-'77	4 60	00	4 20	85 0	4	3 60	10	024		0	SW	6	G	?o	?	84	1 01
	„ „	60	00	4.0	0	4	„	„	0.6	SW	6	NE	5	P	?o	?	1 00	1 03
δ	Range	00	.	00	0	0	00	00	00?	..	..	..	.	..	?	?	16	02
v	Means of 2	4 60	..	4 20	85 0	4	3 60	10	025		SW 2				?	?	92	1 02
132.	1 9 '76	3 98	− 04	3 67	85 0	3	6 17	98	480	..	0	..	0	H	?o	?	4·05	3 9,
	„ „	33	− 05	·63	·0	3	„	93	48	.	0		0	W	?o	?	3 55	4 00
δ	Range,	05	..	04	0	0	00	05	01.	.	..	..	.		?	?	.0	03
v	Means of 2,	3 96	.	3·6.	8. 0	3	6 17	96	47		Calm				?	?	3 80	3 99
133	18-10 '77	3 60	00	3 3.	85·0	3	4 3.	·00	?	NE	5	V	4	P	?o	?	61	65
134.	31 8-'76	3 58	+ 06	3 33	8. 0	3	6 22	88	?	SSW	10	SW		W	?o	?	2 08	2 27
135	21 9- 78	3 18	+ 05	2 99	85 0	2	6 22	68	2.3	..	0	..	0	P	?o	1 96	2·16	2 21
136	21 9 78	3 12	+ 03	2 94	8. 0	2¼	6 28	62	208	.	0	..	0	R	?o	1 88	2 27	2 27
137	31-8 7(	3·13	+ 10	2 94	85 0	3	6 47	43	200	..	0	SW	12	H	?o	?	1 90	2 11
138	31 8- 76	2 88	+ 05	2 72	85 (	2	6 .2	18	14.	..	0	.	0	W	?o	?	2·0,	2 13
139	20-9 78	2·71	− 02	2 57	85·0	2	6 6.	21	168	NW	1	V	1	R	?o	1 44	1 61	1 81
	„ „	60	00	2 47	·0	2	6 00	10	13	V	1	S	1	P	?o	1 28	1 17	1 36
δ	Range,	11		10	0	0	11	11	035	..		..	.	..	?	·16	44	45
v	Means of 2,	2·66	..	2 52	85·0	2	5 ..	16	151		S 1				?	1·36	1·39	1 59

AND CUBIC DISCHARGES — TABLE XLI

[Left Aqueduct Closed]

tin Tube Rods]

6														7	8
VELOCITIES each vertical (is the mean of three observations).														Cubic Discharge in cub feet per sec	Mean Velocity
centre.						Centre	R ght of centre.								
37½	3o	32½	30	21	10		10	20	30	32½	35	37½	39½	42½	D	V
1·03	1 14	1 13	1 05	1 17	1 19	1 29	1 36	1 32	1 35	1 35	1 32	1 19	1 12	?o	472 2	1 21
1 1o	1·05	1 14	1 12	1 21	1 23	1 37	1 43	1 38	1 33	1 38	1 32	1 21	1 14	?o	491 4	1 26
10	06	01	0	04	04	08	07	06	02	03	00	02	02	?	19 5	05
1·08	1 11	1 14	1 09	1 19	1 91	1 33	1 40	1 3o	1 34	1 37	1 32	1 20	1 13	?	481 9	1 24
4 22	4 32	4 65	4 76	4 92	5 22	5 17	5 50	5 36	5·00	5 00	4 84	4 35	3 80	?o	1 648	4 87
38	4 20	4 41	4 51	5 00	5 22	5 13	5 1o	5 26	4 84	5 00	4 65	4 20	3 77	?o	1,597	4 78
35	12	24	25	08	00	04	37	10	16	00	19	15	03	?	51	09
4 0o	4 76	4 o3	4 64	4 96	5 22	5.15	5 3o	5 31	4 9o	5 00	4 7o	4 28	3·79	?	1 623	4 83
71	6o	63	65	6o	64	71	79	77	7o	77	74	73	65	?o	212·0	6n
2 24	2 7o	2 83	2 9o	3 19	3 49	3 7o	3 59	3 51	3 51	3 39	3 11	2 79	2 78	?o	979 3	3 22
2 55	2·6	2 82	3·01	3 3o	3 49	3 5	3 3o	3 47	3 43	3 19	3 14	3·00	2 40	?o	86o 6	3 20
2 16	2 43	2 53	2 65	2·91	3 33	3 19	3 00	3 06	3 06	3 13	3 06	2 97	2 42	?o	740 9	2 79
2 05	2 20	2 26	2 26	2 31	2 56	2 68	2 91	2 94	2 90	2 68	2 6o	2 28	2 15	?o	667 9	2 51
2 11	2 35	2 31	2 34	2 4	2·61	2 46	2 94	2 83	2 74	2 40	2 43	2 26	1 95	?o	620 7	2 54
1 69	1 72	1 88	1 94	2 14	2 33	2 56	2 56	2 61	2 50	2 52	2 40	2 29	2 04	?o	52o 6	2 28
1 66	1 52	1 6o	1 74	2 04	2 3)	2 37	2 43	2 33	2 35	2 26	2 26	2 18	1 90	?o	467·0	2 11
03	20	23	20	07	06	19	13	28	15	26	14	11	14	?	58 6	17
1 68	1·6o	1 77	1 84	2 11	2 36	2 47	2 90	2 47	2·43	2·39	2 3o	2·04	1 97	?	496·3	2 20

MEAN VELOCITIES

Solání Embankment

[*Instrument*—1″

Serial No.	Date 1876 77 78 79	1	2 Depth. Above Datum. h	Variation.	Central H	Solání Aqueduct Gauge	Hyd Mean. D	Surface Breadth b	3 Fall of Water-Surface. Upper 4 miles F_1	1 mile below Site F	Lower 4½ miles F_2	Local Slope. s	4 Wind From Direction	Velocity	To Direction.	Velocity.	5 Timekeeper's Initial	Left Steps Immersed. Top	q	m	Last
												230	E	7	..	0	A	46	2 61	3 09	3 2[illegible]
												22[illegible]	S	5	E	7	P	1 [illegible]8	2 68	2 79	3 41
												223	E b S	8	D	12	P	1 74	2 58	2 91	3 28
												226	E	4	E b S	8	A	1 84	2 74	2 94	3 33
												228	S	3	W	10	A	1 67	2 61	2 91	3 31
Sl	"																				
δ	Range,		16	..	16	23	07	1 2	09	10	20	007	..	..	..	.		1 38	16	30	18
v	Means of 5,		9 94	..	10 97	9·87	9 34	170 1	4 70	1 25	5 46	227	LSE 4					1 50	2 64	2 93	3 31
Series 152.	29 5 '78		10 03	− 07	11 20	9 98	9 23	171 0	4 70	1 22	5 53	213	W	8		0	G	5[illegible]	2 48	3 00	3 14
	21 12 '76		9 98	− 01	16	10·00	·19	·0	4 80	1 15	5 95	?	E	5	SE	5	W	1 75	2 86	3 13	3 31
	22 12- "		98	00	16	·00	·19	·0	4·80	1 15	5 95	20[illegible]	E	5	W	8	P	1·94	2 86	3 13	3 19
	" "		98	00	·16	·00	[illegible]	[illegible]					W	8	W	10	[illegible]	[illegible]	7 8[illegible]	[illegible]	[illegible]
	15 12 "		97	·00	15	00															
	19 12 "		97	− 01	·15	0[illegible]															
	16 12- "		96	+ 02	14	05															
	18 12 "		9[illegible]	00	13	00															
	20 12 "		9[illegible]	+ 01	13	00															
	8 12 "		89	+ 03	07	9 80															
	" "		91	+ 02	09	80															
	14 12 "		·87	+ 02	0[illegible]	9[illegible]															
	26 12 "		85	+ 01	03	84															
	" "		8[illegible]	00	03	85															
	29 12 "		8[illegible]	+ 03	00	80															
	9-12 "		77	00	10 9[illegible]	8[illegible]															
	12 12 "		77	00	95	8[illegible]															
δ	Range,		26	..	25	25	15	2 3	·13	20	10	?024	..	..	..	.	.	1 48	40	65	83
v	Means of 17		9 91	..	11 09	9 93	9 17	170·3	4 79	1 1[illegible]	5 94	?200	S δ E 3					1 67	2 68	3·03	3 20
Series 153.	6 1-'77		9 71										E	9	SE	6	W	1 64	2 73	3 30	2 83
	8-12 76		57										..	0	S	8	F	1 28	2 37	2 84	3 03
	[illegible] 5-'78		[illegible]0	−									W	7	W	9	G	1 24	2 31	2 75	3 21
	12 4 "		42										E	8	E	8	G	1 16	2 22	2 69	2 88
	27-[illegible] "		[illegible]5	−									V	7	V	9	F	99	2 18	2 51	2 93
	1-[illegible] "		[illegible]0	+									W	9	W	2[illegible]	F	85	2 20	2 51	2 91
δ	Range,		[illegible]8	..	43	·27	·21	0	21	19	72	?062	.	.		.		79	55	79	38
v	Means of 8,		[illegible]		[illegible]	9 48	8 96	168·[illegible]	4 7[illegible]	1 [illegible]1	5 16	?22	SW b W 2					1 19	2 34	2 77	2 [illegible]0

AND CUBIC DISCHARGES. TABLE XLII.

MAIN SITE

tin Tube Rods]

6																		7	8
MEAN VELOCITIES past each vertical [Each Velocity is the mean of three observations]																		CUBIC DISCHARGE in cub feet per sec	MEAN VELOCITY
of centre.							Centre	Right of centre						Steps immersed					
74½	70	65	60	40	20		20	40	60	65	70	74½	Last	m	g	Top		D	V
																			4·09
																			4 11
																			3 93
																			4 04
3 09	3 59	3 61	3 45	3 8₅	4 00	4 17	4 41	4 22	3 92	3 39	3 33	3 00	3 01	2 83	2 26	94		6,940	3 91
22	34	31	35	46	41	68	49	46	24	41	40	16	18	48	26	48		424	20
3 13	3 54	3 83	3 63	4·0₅	4 15	4 28	4 23	4 30	3 80	3 59	3 53	3 10	3 09	3 04	2 39	1 03		7,170	4·02
																			3 91
																			3 8₃
																			3 93
																			3 88
																			3 82
																			3 88
																			3 84
																			3 93
																			3 8₀
																			3 88
																			3 8₀
																			3 8₄
																			3 74
																			3 8₀
																			3 6₄
																			3 82
																			3 91
45	40	49	58	49	85	65	74	62	57	66	62	33	37	51	42	1 04		545	20
2 97	3 45	3 62	3 5₀	3 93	3·97	4·01	3 9₀	4 04	3 74	3 5₀	3·38	2 93	3 16	3 06	2 43	1 1₀		6,725	3 8₀
																			3 84
																			3 7₀
																			3 67
																			3 67
																			3 72
																			3 64
42	30	37	48	36	35	23	59	47	23	47	30	35	26	72	31	59		436	20
2 83	3 29	3·50	3 66	3 75	3 99	3 88	3 82	3 93	3 61	3 47	3 29	2 84	3 11	2·99	2 5₉	1 71		6,276	3·71

MEAN VELOCITIES

Solani Embankment

[*Instrument*—1″

Serial No	Date, 18 & 77 &c	2 Depth: Above Datum A	Variation	Central H	Solani Aqueduct Gauge	Hyd Mean R	Surface-Breadth b	3 Fall of Water-Surface: Upper 4 miles F_1	1 mile below Site F_2	Lower 4½ miles F_3	Local Slope S	4 Wind: From Direction	From Velocity	To Direction	To Velocity	5 Timekeeper & Initial	Left: S pe Immersed. Top	q	m	Last
Series 154	4 12 77	9 19										S	4	S	9	G	1 65	2 14	2 75	2 88
	10 4 78	11	+									V	1	.	0	G	1 67	2·08	2 50	3 03
	7 12 ,,	·05	+									..	0	..	0	P	1·62	2 18	3 31	3 30
	6 12 77	·02	+									WNW	7	W	17	P	1 49	2 31	2 ,4	2 74
	7 12 ,,	·01	+ 01	19	·88	64	··	4·72	1 30	4 78	220	S	3	W	7	G	1 34	2 22	2 ,8	3 09
	δ Range	18	.	·26	12	18	1 2	·14	13	12	?038	..	..	..	.		33	23	75	56
	v Means of 5	9·08		10·23	8 94	8 68	167 0	4 71	1 32	4 83	?229	SW & W 4					1 5·	2 19	2 83	3·01
Series 155	26											V	1	W	6	P	83	1 78	2 17	2 48
	,,											..	0	..	0	R	1 44	2 60	3 14	3 34
												W	6	..	0	P	1 14	2 05	2 ,3	2 54
												W	6	W	6	G	67	1·62	2 ,8	2 59
												W	20	W	19	P	59	1 9	2 40	2 ,5
	2[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	SW	1	WSW	7	G	4,	1 ,8	1·95	2 33
	δ Range	29	..	34	22	24	0	40	14	30	049	..	.	.	.		97	98	1 19	·91
	v Means of 6	8 74	.	9 87	8 65	8 42	166 ·	4 72	1 26	4 65	21,	W 5					66	1·94	2 46	2 66
156	29 1 7,	8 44	+ ·05	9 69	7 55	8 23	16· 2	3 94	2·06	3 9·	2?·	ENE	11	..	0	P	1 53	1·9,	2 16	2 35
	,,	47	− 02	·6·	58	2·	2	3 91		3·98	,	,	0	E	7	W	1 43	1 6	2 ,6	2 53
	0-1	41	00	·5·	·50	21	2	3 87	2 08	3·9[illegible]	?	NNE	8	N	4	P	1 51	2 04	2 03	2 24
	,, ,,	42	+ 01	60	50	22	·	3·86	2 09		?	N	4	SW	8	W	1 46	2 00	2 07	2 33
	δ Range	06	.	06	08	·04	·0	08	03	08	?						10	37	33	29
	v Means of 4	8·43		9 62	7 53	8 23	16· 2	3 90	2 0	3 93	?	NE 3					1 4·	1 92	2 14	2 36
Series 157	21 3 8	8 24										SE	3	V	4	Q	1 30	1 ,9	2 12	2 29
	20-1 7	1·										W	8	W	3	P	1 27	1·90	2 36	2 48
	3-3-	13										S	4	.	0	W	1 42	1·91	2 30	2 45
	6-4-	10										N	4	N	4	P	1 13	2·06	2 26	2 68
	6 3- ,,	·03	+									NW	10	.	0	W	1 26	1 54	2·03	2·60
	1-4- ,,	·07										NW	4	SW	4	P	1·0,	1 87	2 15	2 ,0
	12 3- 78	·0·	00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	SE	6	SE	8	P	·96	1 69	1 83	2 30
	δ Range	19	..	19	23	16	0	07	14	23	?0?5	.		..			46	52	53	41
	v Means of 7	8·12	..	9 29	8·02	8·01	164 0	4 63	1 27	4 27	121?	W 1					1 20	1·82	2 1·	2 50
158	13-9- ,6	7 9·	+ 25	9 1?	7 9·	7 88	164·0	4 73	1 17	4 3·	21·	.	0	W	17	H	?	1·95	2 40	2 74
	11 3- ,,	8·	− 03	·03	·0	80	0	4 8·	1·32	4 10	21		0	E	4	H	·86	2 14	2 ,4	2 44
	δ Range	10	..	10	25	08	0	15	15	25	00[illegible]						?	19	06	30
	v Means of 2	7 90		9·08	7 83	7 84	164·0	4 81	1 2·	4 23	21·	W 3					? 86	2 0·	2·3[illegible]	2 ·9

AND CUBIC DISCHARGES

TABLE XLIII.

Main Site

tin Tube-Rods]

6																	7	8
Mean Velocities past each Vertical (Each Velocity is the mean of three observations)																	Cubic Discharge in cub. feet per sec	Mean Velocity
of centre						Centre.	Right of centre						Steps immersed,					
7½	70	65	60	40	20		20	40	60	65	70	7½	Last	m	q	Top	D	V
																		3 74
																		3 68
																		3 81
																		3 64
																		3 6[illegible]
65	61	30	25	27	50	39	50	30	20	45	52	24	27	13	42	1 24	425	18
2 72	3 2[illegible]	3 4[illegible]	3 41	3·87	3·8[illegible]	3 8[illegible]	4 04	3 9[illegible]	3 54	3 45	3 29	2 84	3 03	2 85	2 3[illegible]	1 55	5,974	3 70
																2 08	5 400	3 48
																1 59	6 353	4 0[illegible]
																1 62	5 017	3 [illegible]8
																1 52	5 37[illegible]	3 4[illegible]
																1 37	5 36[illegible]	3 45
																96	5 212	3 42
79	81	75	97	92	74	79	81	88	45	49	64	50	43	60	79	1 12	1,141	63
2 73	3 07	3 33	3 32	3·74	3 74	3 84	3 74	3 61	3 46	3 49	3 19	2 71	2·84	2 66	2 22	1 5[illegible]	5,564	3 [illegible]8
																9[illegible]	5 003	3 32
																9[illegible]	4 93[illegible]	3 26
																7[illegible]	4 861	3 23
2 12	2 79	2·94	3 01	3 49	3 35	3 [illegible]	3 [illegible]	3 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	7[illegible]	4,73[illegible]	3 1[illegible]
·20	28	28	12	25	12	52	·42	36	40	17	26	20	29	17	09	·26	268	17
2 23	2 76	2 96	3 09	3·36	3 32	3 37	3 34	3 42	3 32	3 0[illegible]	2 86	2 37	2 52	2 22	1 67	84	4 88	3·24
																		3 44
																		3 [illegible]2
																		3 26
																		3 3
																		3 18
																		3 3
																		3 3[illegible]
29	27	21	29	49	54	64	41	67	24	31	56	40	28	59	49	54	470	26
2 38	2 81	3 13	3·06	3·46	3·42	3 50	3 50	3 43	3 23	3 17	2·94	2 [illegible]2	2 73	2 41	2·08	1 52	4,832	3 3
2 56	2 83	3 39	3·06	3·03	4 14	3 77	3 64	3 80	3 45	3 00	2 78	2 54	2 33	2 [illegible]1	2 13	1 36	4 89	3 4[illegible]
2 61	2 97	2 9[illegible]	3 37	3 33	3 47	3 80	3 61	3 68	3 00	3 06	2 73	2 39	2 51	2 3[illegible]	2 3[illegible]	1 19	4,82[illegible]	3 42
05	14	43	31	30	33	03	03	12	45	06	05	15	18	18	18	17	65	01
2 59	2 90	3 16	3 22	3 18	3 81	3 79	3 63	3 74	3 23	3·03	2 76	2 47	2 42	2 42	2·22	1 2[illegible]	4 86[illegible]	3 43

MEAN VELOCITIES

SOLANI EMBANKMENT

[*Instrument*—1″

Serial No	1 Date, 1876-77 78	2 Depth: Above Datum h	Variation	Central H	Solani Aqueduct Gauge	Hyd Mean R	Surface-Breadth b	3 Fall of Water-Surface: Upper 4 miles F_1	1 mile below Site F_2	Lower 4½ miles F_3	Local Slope S	4 Wind: From Direction	From Velocity	To Direction	To Velocity	5 Timekeeper's Initial	Left: Steps immersed, T	p	q	m	Last
Series 159	9 9- 76	7·65	− 04										0	S 14	W		1 59	2 29	2 47	2 54
	9 3 78	63	− 02										0	.. (	P		1 35	1 86	2 01	2 33
	7 3- „	61	00										6	W '	G		1 19	1 63	2 11	2 12
	8-3- „	61	− 01										10	V /	P		1 31	1 55	2 28	2 18
	11-3- „	60	− 01										0	0	G		1 39	1 80	2 08	2 31
	2 3 77	60	00										9	W 14	W		1 49	2 08	2 29	2 41
	12 9 76	59	− 08										0	NE 17	W		1 58	2 11	2 34	2 41
	8-9 „	51	00										0	ENE 6	H		1 49	1 95	?	2 46
	27 2 77	40	00										7	W b S 2	P		1 32	1 92	2 27	2 28
δ Range,		22	..	22	20	·13	1 2	1 07	19	·15	?010	..	..	..	.		40	74	? 46	42
v Means of v		7 59	..	8 77	7 51	7 64	162 0	4 80	1 2ɔ	3 9ɔ	?214	WSW 3					1 40	1 91	?1·98	2 34
Series 160	25-5 76	7 20	+ 09	8 38	7·03	7 36	161 7	4 53	1 34	3 63	218	..	0	V /	G		68	1 45	1 92	2 14
	22 2 „	·07	− 01	2ɔ	90	·26		4 71	1 34	3 50	218	b S	4	S 7	P		?	1 1,	1 6,	2 03
	„ „ „	07	− 01	2ɔ	90;	26	7	„	„	„	213	S	7	W 0	G		?	1 25	1 57	1 83
	„ „ „	10	+ 06	28	96	28		4 68	1 31	3 56	?08	W	6	W 15	P		?	1 23	1 85	2 08
	6 2 „	6 97	00	14	87	21	160 6	4 71	1 27	3 47	210	W	8	W b S 14	G		1 21	1 67	1 83	2 12
	8 - „	93	− 02	10	81	18	5	4 6ɔ	1 29	3 41	214	N	7	N 4	G		1 32	1 66	2 10	2 02
δ Range,		27	..	27	22	18	1 2	18	07	22	010	.	.	.. .			? 64	50	53	31
v Means of v,		7·06	.	8 23	6 91	7 26	161 .	4 67	1 3?	3 5?	214	W 4					?1 07	1 41	1 82	2 01
Series 161.												S	9	WNW 8	G		1 05	1 46	1·81	1 93
	.											.	0	S 4	G		1 13	1 53	1·94	2·07
	.											S	4	. 0	P		1 12	1 53	1 ,6	2 07
	-											E	4	S 2	G		1 21	1 54	1 72	1 91
	24 1 „	·84	+ 02	·01	7ɔ	15	ɔ	4 69	1 26	„	?	S	5	E 4	P		1 07	1 55	1 82	1·97
	„ „ „	·84	− 03	·01	75	15		4 62	1 26	3 4ɔ	?	E	4	SE 2	G		1·06	1 44	1 ,0	1 69
	„ „ „	83	+ 01	·00	75	14	2	4 70	1 2ɔ	„	?	SE	5	E b S 5	P		1·04	1 44	1 72	1 84
	18 2 „	83	00	·00	70	14		4 6ɔ	1 30	3 40	21ɔ	E b S	10	E b S 4	P		1·04	1 63	1 97	1 9?
	22 1 „	82	− 02	7 00	7ɔ	14		4 71	1 24	3 4ɔ	?	S	8	E 1	G		1 09	1 49	1 75	1 ,0
	„ „ „	82	+ 01	00	75	14		„	„	„	?	E	5	S 2	P		1·06	1 46	1 ,6	1 79
	14 2 „	70	00	87	60	·03		4 6?	1 ,7	2 00	21	S	8	S 18	P		82	1 45	1 76	1·83
δ Range,		15	..	15	15	12	0	08	03	55	?000	.					32	19	27	38
v Means of v		6·82		7 99	6 72	7 12	1ɔ9 .	4 68	1 27	3 39	?21	SSL 4					1 06	50	1 ·9	1·89

AND CUBIC DISCHARGES

TABLE XLIV.

MAIN SITE

tin Tube-Rods]

6																	7	8
MEAN VELOCITIES past each vertical. [Each Velocity is the mean of three observations].																	CUBIC DISCHARGE in cub feet per sec	MEAN VELOCITY.
of centre.							Centre	Right of centre.										
														8 ops immersed				
744	70	65	60	40	20		20	40	60	65	70	744	Last	m	g	Top	D	V
																		3 40
																		3 21
																		3 19
																		3 23
																		3 25
																		3 26
																		3 36
																		3 38
2 14	2 [illegible]	3 01	2 9	2 9[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		3 05
47	18	27	75	67	47	55	45	43	22	31	22	51	35	51	55	21 14	590	35
2 30	2 84	3 07	3 12	3 30	3 40	3 42	3 44	3 45	3 17	3 09	2 89	2 41	2 44	2 20	1 78	21 24	4,459	3 20
																1 48	4 162	3 19
																85	4,093	3 19
																83	4 086	3 18
																86	4,15[illegible]	3 22
																70	4,154	3 28
																60	4,072	3 2[illegible]
18	30	31	34	16	57	33	30	32	36	35	23	36	51	43	35	88	91	10
2 14	2 62	2 99	2 99	3 45	3 49	3 30	3 30	3 37	3 13	2 93	2 73	2 30	2 24	1 84	1 58	87	4,120	3 22
																1 43	3 834	3 0[illegible]
																1 51	3 909	3 14
																1 38	3 958	3 16
																1 4[illegible]	3,868	3 11
																1 31	3 66[illegible]	3 10
																1 40	3 930	3 16
																1 34	3,917	3 14
																1 42	3,811	3 06
1 90	2 52	2 75	3 03	3 23	3 30	3 13	3 33	3 17	3 13	3 03	2 84	2 36	2 14	1 90	1 09	1 38	3,831	3 08
1 83	2 45	2 79	2 83	3 16	3 [illegible]	3 26	3 19	3 24	3 01	2 97	2 60	2 22	2 01	1 [illegible]	1 71	1 [illegible]	3 82[illegible]	3 08
2 01	2 52	2 82	2 80	3 21	3 06	3 30	3 49	3 47	2 96	2 65	2 49	2 15	2 20	1 89	1 53	1 2[illegible]	3,80[illegible]	3 11
34	33	28	40	41	38	38	41	34	23	38	41	25	32	42	27	24	155	11
1 90	2 54	2 76	2 94	3 24	3 21	3 28	3 31	3 27	3 03	2 75	2 67	2 19	2 12	1 97	1 71	1 3[illegible]	3,868	3 11

N

MEAN VELOCITIES

Solání Embankment

[*Instrument*—1″

* Series 163 only 3 steps immersed. † Series 164, 165,

Serial No	1	2						3				4				5				
	Date 1876 77 78	Depth						Fall of Water-Surface.				Wind								
												From		To						
		Above Datum.	Variation	Central	Solání Aqueduct Gauge	Hyd. Mean.	Surface-Breadth.	Upper 4 miles	1 mile below Site.	Lower 4½ miles	Local Slope	Direction	Velocity.	Direction	Velocity	Timekeeper's Initial	Left			
																	Steps immersed			
		h.		H		R	b	F_1	F_2	F_3	S						Top	q	m	Last
Set.																				
	" "	26	− 02	·44	33	68	·3	5 27	"	3 13	160	ENE	7	NE	4	W	?	2 29	2 61	2·90
δ	Range.	26	..	26	22	22	0	·33	17	·30	123	..	..	..	..	..	? 69	1 10	95	94
v	Means of δ,	6 39	..	7 56	6 42	6·78	159 3	5 10	1·14	3 15	221	SE δ E 2				.	?1·03	2 02	2·21	2 57
Series 163.	21-10-'76	5·66	− 01	6 84	5 60	6 25	157 0	5·07	1 23	2 70	155	..	0	..	0	H	73		1 60	1·75
	" "	·62	− 02	80	·56	22	·0	5 11	"	2 66	150	..	0	S	0	W	63	*	1 67	1 82
	19-10- "	5·5	00	73	·49	16	0	5 13	1 23	2 59	200	W	7	..	0	H	?		1 80	1 95
	" "	·56	+ 01	74	50	17	0	5 17	"	2 60	190	W	12	SW	4	W	?	* * *	1 80	1 80
	20-10- "	55	− 01	73	50	16	·0	5·08	1 22	2 60	160	..	0	..	0	H	?		1 57	1 70
	" "	·51	− 01	·69	·46	13	·0	5 12	"	2 56	160	..	0	..	0	W	?		1 59	1 87
δ	Range.	15	..	15	14	12	0	10	01	14	050	..	..	..	..	..	? 10	..	23	25
v	Means of δ,	5·58	..	6 76	5 52	6 18	157·0	5 11	1 23	2 62	171	WSW 2					? 68	..	1 67	1 82
164.	11-10-'77	5 24	+·75	6 42	14 69	5 98	154 7	5 29	1 72	2 49	?	W	7	N	4	P	60	* * †	* * †	1 58
Series 165.	10-10-'77	5·01	− 03	6 19	4·92	5 78	154 7	4 42	1 26	2 32	?	E δ S	5	SW	7	G	1 61			1 42
	10-10-'76	4·97	+ 02	15	5 20	75	7	4 91	0·94	1 30	180	..	0	NW	6	W	87	* * †	* * †	1 13
	" "	5·00	+·03	18	20	78	7	4 88	0·97	"	170	NW	6	..	0	P	83			1 61
	" "	·00	00	18	20	78	7	4 63	"	"	..	..	0	W	6	W	94			1 58
	11-10- "	4 90	− 03	·08	30	63	7	4 63	0·77	1 20	140	..	0	E	14	P	·75			1·32
	" "	86	00	·04	30	63	7	4 67	0 73	"	150	..	0	..	0	W	75			1 44
δ	Range.	·15	..	15	·38	13	·0	·49	·53	1 12	?040	..	..	..	.	.	26	..	..	33
v	Means of δ,	4·90	..	6 14	5 19	5 74	154 7	4 69	94	1 47	?10·3	N δ E 1				.	·80	..	..	1·46
166.	10-10-'77	4 53	− 07	5 71	4 30	5 44	152 .	4 70	1·20	1 90	?	WSW	9	WSW	6	G	..	..	..	·93
	9-10-'76	46	− 02	·64	75	39	2	4·87	0·88	1·5.	15.	..	0	E	1.	P	* * *	* * *	* * *	1 14
	11-10-'77	20	·00	44	20	21	.	4 77	1·22	2 00	?	E	4	E	1.	G				·85
δ	Range.	27	..	27	55	·23	0	·17	35	65	?	..	..	..	.	.	..	..	..	22
v	Means of δ,	4 41	..	5·60	4 45	5 33	152·0	4 4.	1 10	1 75	?	ESE 3					..	..	..	·97

AND CUBIC DISCHARGES — TABLE XLV.

MAIN SITE

tin Tube Rods]

only 3 steps immersed. ‡ Series 156 on y 1 step immersed.

6																		7	8
MEAN VELOCITIES past each vertical [Each Velocity is the mean of three observations].																		CUBIC DISCHARGE in cub feet per sec	MEAN VELOCITY
of centre.							Centre	Right of centre						Steps immersed					
744	70	65	60	40	20		20	40	60	65	70	744	Last	m	q	Top		D	V
																			3 36
																			3 15
																			3 49
																			3 41
																			3 52
1 25	98	64	48	52	39	45	54	30	88	39	42	52	98	35	62	·40		342	·37
2 75	3·24	3 29	3 26	3 40	3 44	3 46	3 45	3 63	3 23	3 07	2 86	2·35	2 56	2 09	1 75	99		3,973	3 39
																85		3 342	3 15
																77		3,280	3 12
																83		3,18	3 06
																82		3,127	2 99
																76		3,160	3 04
2·08	2 44	2 63	2·84	3 08	3 14	3 11	3 26	3 16	2 58	2 37	2 21	1 92	1 05	1 44	see*	78		3,055	2 95
15	23	33	53	73	45	42	43	25	36	22	46	32	·33	39	.	09		287	20
2·03	2 52	2 82	2 87	3 20	3·31	3 34	3 12	3 23	2 68	2 34	2 20	1 74	1 52	1 41	..	·80		3,194	3 05
1·68	1 96	2 30	2 14	2 61	2 82	2 87	3 31	2 99	2 94	2 61	2 55	2 01	1 90	see†	see†	1 49		2,715	2 75
																98		2,748	2 87
																97		2,492	2 62
																84		2,480	2 60
																87		2,308	4 60
																83		2,278	2 42
														see†	see†	89		2,225	2 38
25	27	37	46	38	58	21	44	·47	80	70	54	28	·39	..	.	15		520	49
1 60	2 06	2 19	2·35	2·66	2 63	2 64	2 55	2 66	2 45	1 99	1 96	1·47	1 30	..	..	·90		2,432	2 56
1 51	1 66	1 97	2 10	2 42	2 56	2 56	2 61	2 63	2 26	2 01	1 80	1 56	1·03	see ‡	see ‡	‡‡		2,117	2 39
1 49	1 88	2 05	2 20	2 54	2 59	2 59	2 33	2 50	2 42	1 95	1 80	1 25	·96	see ‡	see ‡	see ‡		2,010	2 42
1 42	1 89	2 17	2 04	2 19	2 59	2 48	2 50	2 65	2 19	2 05	1 71	1 40	·90	see ‡	see ‡	see ‡		1,968	2 33
09	23	20	16	35	·03	11	28	15	23	10	09	33	13	..	..	..		149	07
1 47	1 81	2·06	2 11	2 38	2 58	2 54	2 48	2 59	2 29	2·00	1 77	1 40	96	..	..	..		2,061	2 37

MEAN VELOCITIES

Solání Embankment

[*Instrument*—1"

V. S.—Series 167 168 — Lowest Step slightly immersed on Right Bank throughout.

Serial No	1 Date, 1876-77	2 Depth: Above Datum A	Variation	Central H	Solání Aqueduct Gauge	Hyd. Mean B	Surface Breadth b	3 Fall of Water-Surface: Upper 4 miles F_1	1 mile below Site, F_2	Lower 4½ miles F_3	Local Slope S	4 Wind: From Direction	From Velocity	To Direction	To Velocity	5 Timekeeper's Initial	Left 75	Left 73½
Series 167.	15-2-'77	4·09	− 12	5 27	4 35	5·06	152 3	4 24	0·91	1 15	?	SW	11	SW	21	W		1 19
	7 10-'76	·08	− 02	·06	50	·05	52	4 60	0·75	1 30	200	..	0	NE	5	P		1 32
	" "	07	·00	25	49	·05	53	4·66	"	1 29	"	NE	5	E	21	W		1 35
	10-2-'77	·00	00	18	·07	·02	151 2	4 83	1 10	1 97	?	S & E	5	SW	8	W		1 23
	" "	·00	·00	18	·07	·02	52	"	"	"	?	SW	8	SW	19	P		1 21
	14-2 " "	3·98	00	16	10	·00	52	4 70	1·05	1 70	180	..	0	S	10	W		1 14
	" "	98	00	16	10	·00	52	"	"	"	"	S	10	SSW	15	P		1 19
	19-2- "	99	− 02	17	35	·01	52	4 59	0·81	2 15	?	E	4	SW	7	P		1 17
	" "	96	− ·04	14	32	98	52	4·62	"	2 12	?	SW	7	S	7	W		1 40
	" "	92	− 04	10	28	95	52	4 66	"	2·03	?	S	7	W	11	P		1 22
	δ Range.	·17	..	·17	43	·11	1 2	59	35	1 00	?	..	..	..	.		?	·26
	r Means of 10	4·01	..	5 19	4 26	5·01	151 5	4·65	91	1 74	?	SSW 5					?	1 24
168.	15 10-'77	3 98	− 23	5 16	4 50	5·00	151 2	4 45	65	60	?	ENE	9	E	17	G	?0	1 22
Series 169.	17 2-'77	3·79	− 03	4 97	4 00	4 87	150·6	4 39	0 96	0·90	?	SW	6	S	6	P		1 14
	" "	78	00	·96	3 99	86	6	4 40	0·95	0 89	?	S	6	SW	15	W		1 10
	8-2- "	73	·00	·93	75	83	6	4 78	1·17	1 75	?	NE	8	S	13	P		1 33
	6-10-'76	·76	·00	·94	4·00	·84	6	4·67	0 93	1·00	200	..	0	..	6	P		1 25
	" "	75	− 02	93	·00	83	6	4·68	0·92	"	"	..	0	NNE	7	W		1 29
	" "	73	− 01	·91	·00	·81	6	4 70	0 90	"	"	NNE	7	NE	5	P		1 20
	" "	72	− ·02	·90	·00	·81	6	4·66	0·89	"	"	NE	5	..	6	W		1 25
	5-10- "	72	− 01	90	3 40	·81	6	4 71	1·40	0·40	200	..	0	..	6	W		1 27
	" "	·71	− ·01	89	40	·80	6	4 72	1·48	"	"	..	0	NE	10	H		1 19
	" "	70	− ·02	88	40	79	6	4 73	1 47	"	"	NE	10	ENE	18	W		1 30
	δ Range.	09	..	09	60	08	0	39	60	1 35	?	..	.	..	.	.	?	23
	r Means of 10	3·74	..	4·92	3 79	4·83	150·6	4·64	1 12	·87	?200	E 3					?	1 24
170	15-10-'77	3·64	− ·06	4 82	4·25	4 73	150·6	3·7	·50	·30	?	SE & S	5	V	.	G	?0	·90
	23-9-'76	·63	− ·06	81	·10	72	6	4 40	·70	·60	160	..	0	..	6	H	?0	1·07
	δ Range.	01	..	01	15	·01	0	·61	·14	25	?	..	..	..	.		?	17
	r Means of 3	3·64	..	4 82	4 18	4 73	150·6	4 10	·63	·48	?160	SE & S 1					?	99

TABLE XLVI

AND CUBIC DISCHARGES

Main Site

(in Tube Rods)

on Left Bank only in three top Sets of Series 167 Series 169 1 0 No Site immersed.

6																7	8
MEAN VELOCITIES past each vertical. Each Velocity is the mean of three observations.																CUBIC DISCHARGE in cub. feet per sec	MEAN VELOCITY
of centre.							Centre	Right of centre									
2½	70	65	60	40	20		20	40	60	65	70	2½	73½	S	Last step	D	V
1 31	1 66	1·92	1 94	2 40	2 38	2 20	2 14	2 3	2 06	1 70	1 45	1 30	1 13	Not observed	40	1 70	2 1
1 42	1 61	1 64	1 82	2 31	2 33	2 05	2 10	2 34	1 78	1 62	1 44	1 36	1 18		?	1 680	2 0
1 35	1 8	1 56	1 83	2 26	2 27	2·1	2 03	2 27	2 03	1 59	1 46	1 26	1 12		?	1 681	2 06
1 47	1 60	1 9	1 92	2 36	2 25	2 30	2 35	2 23	2 28	1 74	1 58	1 52	1 30		44	1 746	2 17
1 54	1 69	1 93	1 84	2 09	2 40	2 44	2 26	2 29	2 22	1 84	1 61	1 49	1 22		43	1 739	2 16
1 37	1 6	1 88	1 97	2 42	2 34	2 24	2 31	2 35	2 14	1 98	1 7	1 59	1 24		?	1 70	2 20
1 30	1 59	1·85	1 75	2 64	2 33	2 15	2 20	2 29	2 27	1 75	1 68	1 37	1 23		?	1 753	2 19
1 42	1 57	1 96	1 99	2 30	2 27	2 15	2 14	2 38	2 28	1 79	1 61	1 53	1 24		34	1 72	2 15
1 41	1 0	1 94	2·03	2 33	2 32	2 19	2 24	2 24	2 19	1 71	1 68	1 46	1 41		45	1 711	2 14
1 40	1 66	1 89	2 16	2 03	2 42	1 95	2 39	2 27	2 08	1 76	1 76	1 42	1 4		?	1 66	2 0
24	21	40	41	35	17	49	36	15	50	39	32	33	30		? 11	94	14
1 40	1·66	1 8	1·93	2·34	2 33	2 18	2 2	·30	2 13	1 7	1 60	1 43	1 2		? 41	1 72	2 14
1 36	1 40	1 6	1 51	1 74	1 8	1 72	1 55	1 84	1 72	1 53	1 29	1 09	1 09	?o	?o	1 30	1·69
1 00	1 39	1 69	1 79	2·0	1 96	1 83	2·03	2 00	1 90	1 65	1 59	1 28	1 17	Zero in computing D.	Not immersed	1 444	1 87
1 26	1 39	1 47	1 74	1 80	1·94	1 79	1 89	2·03	1 66	1 63	1 40	1 21	1 13			1,374	1 78
1 46	1 50	1·92	1 80	2 34	2 42	2 19	2 16	2 29	2 00	1 84	1 65	1 29	1 14			1 63	2 13
1 36	1 50	1 55	1 73	2 27	2 10	1 82	1·81	2 08	1 73	1 67	1 37	1 36	1 15			1 469	1 91
1 33	1 56	1 75	1·86	2 24	2·08	1 78	1 90	2 07	1 55	1 38	1 37	1 23	1 10			1 449	1 89
1 26	1 51	1 51	1 76	2·05	1·96	1 85	1 71	2 05	1 78	1 46	1 32	1 16	1 10			1 411	1·85
1 30	1 49	1 58	1 67	2 21	1 97	1·67	1 86	2 12	1 89	1 50	1 30	22	1 13			1 424	1 87
1 31	1 37	1 62	1 69	2 13	2 09	1 79	1 76	2·09	1 62	1 5	1 45	1 32	1 12			1 420	1·86
1 29	1 55	1 57	1 56	10	98	1 85	1 89	2 0	1 76	1 53	1 23	1 22	1 21			1 410	1·85
1 40	1 44	1 62	1 65	2 14	1 95	1 83	1 86	1 96	1 78	1 50	1 33	1 26	1 07			1 404	1 85
20	19	45	30	54	48	52	45	33	45	46	42	20	14	?		261	35
1·33	1·47	1 63	1 73	2 13	2 0	1·84	1·89	·07	1 77	1·57	1 40	1 ·6	1 13	?		1 44	1·89
1·06	1 10	1 32	1 15	1 62	1 55	1 50	1 40	1 57	1 52	1 16	1·06	99	92	?o	No mine fed.	1 096	1 46
1 19	1 28	1 23	1 40	1 85	1 80	1 35	1 52	1 71	1 51	1 31	1 10	1·01	94	?o		1 15	1 54
13	18	09	25	23	25	15	12	14	01	15	04	02	02	?		56	·08
1 13	1 19	1 ·8	1 ·8	1 74	1 68	1 43	1 46	1 64	1 ·9	1 24	1·08	1·00	93	?		1 ·94	1··0

MEAN VELOCITIES

Solasi Embankment

[illegible]—1st

Series 171 to 173-3rd

Serial No.	Date, 1876 77 78	1	2					3				4				5		
			Depth					Fall of Water-Surface				Wind.						
			Above Datum	Variation	Central	Point of Circle	Hyd. Mean	Surface-Breadth	Upper 4 miles	4 to 8 miles below it	Lower 4 miles	Local Slope	From		To		Time keeper's Initial	Left
													Direction	Velocity	Direction	Velocity		
			h		H	A	R	b	F_1	F_2	F_3	S						s / f
171	31 12-77		3·61	+·01	4·[illegible]	4·[illegible]	4·[illegible]	1·00	3·66	·24	·10	0[illegible]	S	4	S	17	G	·[illegible] / ·60
	23-10- "		·61	+·03	·[illegible]	·[illegible]	·[illegible]	[illegible]	3·62	·24	·04	"	S	[illegible]	SW	18	P	·[illegible] / ·55
	" "		·57	·03	·[illegible]	·[illegible]	·[illegible]	[illegible]	3·66	·24	·00	"	E	10	S	[illegible]	G	·[illegible] / ·52
	d Range		10		10	10·1	·05	[illegible]	·04	·00	10	?	.	.	..	.		? / ·05
	m Mean of 3		3·62	.	4·[illegible]	4·[illegible]	4·[illegible]	1·00	3·[illegible]	·24	·0[illegible]	·00	S 9					? / [illegible]
172	26-10-77		3·64	·00	4·[illegible]	·[illegible]	4·[illegible]	1·00	3·33	·26	·0[illegible]	?	SE	10	.	[illegible]	P	·[illegible] / ·[illegible]
	27-10- "		·61	−·03	·[illegible]	·[illegible]	·[illegible]	[illegible]	3·42	·13	·0[illegible]	?	SW	4	S W	10	G	·[illegible] / ·40
	d Range		13		·13	·00	·11	[illegible]	·03	·13	·00	?	..	..	..	.	.	? / ·02
	m Mean of 2		3·[illegible]	.	4·[illegible]	·[illegible]	4·[illegible]	1·00	3·41	·2[illegible]	·0[illegible]	?	S S W 3					? / ·[illegible]
Series 173	8-10-73		3·[illegible]	−·01	3·[illegible]	4·[illegible]	3·[illegible]	1·00	4·24	·41	10	0[illegible]	..	0	E	11	E	[illegible] / 1·05
	9-10- "		·[illegible]	·03	·[illegible]	·[illegible]	·[illegible]	[illegible]	4·24	·41	10·	0[illegible]	..	0	SW	17	E	[illegible] / 1·03
	9-10- "		·[illegible]	−·02	91	·[illegible]	·[illegible]	[illegible]	4·31	·33	10·	0[illegible]	E	[illegible]	E	[illegible]	P	[illegible] / 1·03
	10-10- "		·44	·00	·[illegible]	23·	·04	[illegible]	4·24	·41	·0[illegible]	0[illegible]	E	8	E	1[illegible]	E	[illegible] / 1·0
	11-10- "		·41	−·02	·[illegible]	20·	·04	[illegible]	4·[illegible]	·41	10·	0[illegible]	[illegible]	0	N	[illegible]	P	[illegible] / 1·06
	d Range		·05	..	·[illegible]	·[illegible]	·04	[illegible]	10	02	·05	01[illegible]	..	..	..	.		? / ·03
	m Mean of 4		3·47	..	3·91	4·[illegible]	3·[illegible]	1·00	4·29	·41	·0[illegible]	0[illegible]	E S S 3					? / 1·06
174	29-3-78		3·04	−·[illegible]	4·[illegible]	3·[illegible]	4·[illegible]	1·00	4·[illegible]	·51	·0[illegible]	12[illegible]	..	0	..	0	W	? / ·9[illegible]
Series 175	4-10-78		2·[illegible]	+·03	4·[illegible]	2·[illegible]	4·[illegible]	1·00	[illegible]	1 14	1·40	21	..	0	..	0	E	[illegible] / 1·06
	" " "		[illegible]	+·01	·[illegible]	·[illegible]	·[illegible]	[illegible]	3·[illegible]	1 17	"	"	..	0	..	0	W	[illegible] / 1·11
	" " "		[illegible]	·[illegible]	10	·[illegible]	·[illegible]	[illegible]	3·01	1 19	"	"	..	0	..	0	E	[illegible] / 1·05
	" " "		[illegible]	−·01	·03	·[illegible]	·[illegible]	[illegible]	3·0[illegible]	1 [illegible]	"	"	..	.	..	.	W	[illegible] / 1·04
	" " "		[illegible]	−·02	·03	·[illegible]	·07	[illegible]	3·[illegible]	1 17	"	"	SW	[illegible]	W	[illegible]	E	[illegible] / 1·00
	d Range		·[illegible]	..	·03	·03	·04	[illegible]	·03	·03	·0[illegible]	00	.	.	.	.		? / 11
	m Mean of 5		2·[illegible]	..	4·[illegible]	2·[illegible]	4·[illegible]	1·00	3·[illegible]	1 17	1·40	21	W S W 2					? / 1·0[illegible]

TABLE XLVII

AND CUBIC DISCHARGES

Main Site

tin Tube Rods]

steps immersed.

6														7	8
Mean Velocities past each vert cal [Each Velocity is the mean of three observations														Cubic Discharge in cubic feet per sec.	Mean Velocity
of centre						Centre	Right of centre								
72½	0	65	60	40	20		20	40	60	65	70	72½	73½	5	D	V
6	69	77	9	1 12	1 04	91	93	99	91	70	69	64	59	?o	704·0	93
60	63	6	·66	89	89	80	85	87	75	71	55	57	50	?o	600 7	81
54	60	70	68	99	98	81	90	92	83	62	64	55	47	?o	624	84
13	09	07	13	23	15	11	08	12	16	09	14	09	12	?	104 2	12
60	·64	74	71	1·00	97	84	·89	93	83	·68	63	59	52	?	643 ?	86
48	51	53	55	85	74	74	0	81	65	51	50	46	45	?o	516 ?	69
41	48	51	49	72	67	59	68	69	60	45	36	34	3	?o	450 3	62
07	03	02	06	13	07	15	02	12	05	06	14	12	14	?	65 9	07
45	50	·5?	52	79	71	67	69	75	63	48	43	40	38	?	483 ?	66
1 19	1 20	1 42	1 36	1 51	1 40	1 35	1 47	1 45	1 43	1 38	1 24	1 19	1 02	?o	852 7	1 40
1 16	1 24	1 38	1 43	1 43	1 35	1 41	1 41	1 31	1 40	1 28	1 38	1 17	1 03	?o	828	1 36
1 15	1 27	1 35	1 40	1 46	1 46	1 30	1 46	1 40	1 37	1 32	1 25	1 04	96	?o	794 4	1 31
1 06	1 32	1 29	1 40	1 44	1 45	1 38	1 29	1 40	1 37	1 2?	1 24	1 15	1·09	?o	820 ?	1 36
1 14	1 33	1 35	1 33	1 30	1 40	1 36	1 38	1 41	1 36	1 ?0	1 33	1 17	1 13	?o	806 1	1 34
13	13	13	10	21	11	11	18	14	07	13	14	15	17	?	58?	09
1 14	1 27	1 36	1 38	1·43	1 41	1·36	1 40	1 39	1·39	1 31	1 29	1 14	1·0?	?	820 ?	1 3?
1 10	1 12	1 15	1 23	1 33	1 38	1 38	1 47	1 46	1 44	1 20	1 20	1 00	91	?o	887·6	1 34
1 2	1 42	1 40	1·62	48	1 71	1·67	1 65	1 92	1 55	1 32	1 29	1 14	1 00	?o	1 15	1 82
1 19	1 44	1 52	1 45	2 09	1 94	1 0	1 80	2 02	1 56	1 30	1 18	1 10	1 11	?o	1 140	1 78
1 23	1 35	1 45	1 56	2·14	1 95	1 68	1 ?8	1·97	2 03	1 45	1 21	1·05	1·03	?o	1 150	1 80
1 26	1 27	1 45	1 49	1·97	1·90	1 66	1 68	1 97	1 87	1 48	1 23	1 11	1 01	?o	1 1?2	1 75
1 2?	1 45	1 39	1 46	2 10	1·92	1 65	1 65	2 05	1 62	1 5	1 14	1 07	·96	?o	1 13	1 ?8
08	18	13	17	51	24	05	22	13	48	27	15	09	15	?	34	07
1 24	1·39	1 44	1 5?	2 16	1 88	1 67	1 6	1 99	1 73	1·4?	1 21	1·09	1·0?	?	1 14?	1 ?9

MEAN VELOCITIES

Solani Embankment

[*Instruments—Nos* 176 *to* 180. 1″ *tin Tube-Rods.*

Series 176 to 181—No

Serial No.	Date 18 6 77 78.	1	2 DEPTHS. Above Datum h	Variation	Central H	Solani Aqueduct Gauge.	Hyd Mean R	Surface-Breadth. b	3 FALL of Water-Surface. Upper 4 miles F_1	1 mile below Site F_2	Lower 4½ miles F_3	Local Slope S	4 WIND From Direction	From Velocity.	To Direction	To Velocity	5 Timekeeper's Initial	Left .8	Left .731
176	26-9-'78		2 83	00	3 27	3 30	3 28	150	5·00	70	·30	?3..	E	8	E	18	P	?o	1 30
	24 9- „		82	00	26	·30	24		5 06	69	30	160	..	0	NW	6	R	?o	1 25
δ	Range.		01	..	01	00	01	0	06	01	00	?163	..	..	..	.		?	05
v	Means of 2		2 83	..	3 27	3·30	3 28	150	5 03	70	·30	?24°	E δ N 6					?	1 28
177.	27 9- 70		2 49	−									..	0	E	10	H	?o	92
	30-9- „		47	+									NE	4	E	1.	W	?o	96
	29-9- „		·40	+									NE	4	NE	4	H	?o	81
	28-9- „		·33	−									E	12	E	2.	W	?o	91
δ	Range.		16	..	·16	25	15	0	12	17	32	?015	..	.	..	.		?	15
v	Means of 4.		2 42	..	3 60	2·51	3 64	150	5 0°	1 08	1 15	?19	E δ N 9					?	90
178	16-10-'77		2 30	00	3·48	3 20	3 53	150	4 63	27	10	?	..	0	SE	8	G	?o	60
	„ „		·53	+ 10	7.	3.	75		4·08	·37	2.	?	SδW	7	..	0	P	?o	·49
δ	Range.		25	..	25	15	22		55	101	15	?	..		..	.		?	·11
v	Means of 2.		2 43	..	3·61	3·29	3·64	150	4·3[illegible]	·92	18	?	SSE 4					?	·5.
179.	2 10- 70		2·00	00	3·18	2·0.	3 2.	150	5·15	1 12	·8.	?	W	.	..	0	H	?o	86
	„ „		1 9	− 02	17	·0.	24		5·19	1 11	.	?	..	0	E	10	W	?o	83
	3-10- „		·8.	00	03	·00	11		5·18	1·0[illegible]	00	180	..	0	..	0	H	?o	81
	„ „		·84	− 02	0.	·00	10		5·19	1·01	„	„	..	0	NE	.	W	?o	80
δ	Range.		·16	.	16	03	10	0	01	11	03	?	..	.	..	.		?	06
v	Means of 4		1 92	..	3·10	2·03	3·18	150	5 19	1·07	·8.	?180	ENE 1					?	·83
180	19-9-'78		1·69	+ 03	2 32	2·30	2 2.	1.0	5·54	·.6	10	150	..	0	.	0	P	?o	·74
	18-9- „		·64	00	2 27	·30	24		5 5[illegible]	21	10	14	NW	7	.	0	R	?o	·63
δ	Range.		05	..	·05	00	04	0	35	33	·00	050	.	.	..	.		?	11
v	Means of 2.		1·67	..	2·3[illegible]	2·30	2 26	150	5 7	·32	10	14	NW 1					?	63
181.	12 7- 7		·35	+ 07	1 53	33	1·69	150	1 58	39	?·0[illegible]	09[illegible]	..	0	S	11	R	?o	20

AND CUBIC DISCHARGES **TABLE XLVIII.**

MAIN SITE

No 181 1″ *wood Rods* (< 1′ *long*), *and* 1″ *tin Tube Rods* (1′ *and* 1½′ *long*)]

steps immersed.

6														7	8
MEAN VELOCITIES past each vertical [Each Velocity is the mean of three observations]														CUBIC DISCHARGE in cub feet per sec	MEAN VELOCITY
of centre						Centre	Right of centre								
72½	0	65	60	40	20		20	40	60	65	70	72½	78½	75	D	V
1 36	1 51	1 55	1 57	1 74	1 74	1 67	1 81	1 70	1 65	1 49	1 51	1 28	1·09	?o	842 7	1 6
1 27	1 52	1 52	1 59	1 68	1 72	1 61	1 74	1 81	1 61	1 60	1 33	1 22	1 04	?o	837 1	1 6
09	01	03	02	06	02	06	07	11	04	11	18	06	05	?	5 6	00
1·32	1·52	1·54	1 58	1 71	1 73	1·64	1 78	1 76	1 63	1 5o	1 42	1 25	1 07	?	839	1 65
1·01	1 22	1 25	1 28	1 73	1 68	1 41	1 47	1 69	1 39	1 20	1 11	96	82	?o	866 5	1 50
1 15	1 26	1 32	1 38	1 82	1 64	1 41	1 39	1·84	1 63	1 26	1 10	1 00	93	?o	905	1 58
1·04	1 20	1 22	1 36	1 83	1 63	1 45	1 48	1 58	1 5?	1 12	1·05	1 04	92	?o	851	1 5?
1 06	1 15	1 23	1 18	1 7?	1 53	1 3?	1 47	1 57	1 39	1 16	99	86	87	?o	788 8	1 42
14	11	10	20	12	15	14	09	27	24	14	12	18	11	?	116 4	16
1·07	1 21	1 26	1 30	1 77	1 62	1 40	1 45	1 67	1 48	1 19	1 06	97	89	?	852·9	1 50
65	66	73	75	94	88	77	89	1 02	81	67	63	·60	59	?o	470·2	86
5?	63	68	·66	85	79	72	77	83	79	63	60	53	49	?o	445	76
14	03	03	09	09	09	05	12	19	02	04	03	·07	10	?	24 9	10
58	65	71	71	90	84	75	88	93	·80	65	62	57	54	?	457 7	81
88	1·02	1 15	1 11	1 59	1 35	1 18	1 21	1 54	1 43	1 15	·93	93	79	?o	677 1	1 34
1 01	1 05	1 06	1 15	1 47	1 32	1 20	1 20	1 50	1 45	1 13	1 05	81	75	?o	629	1 31
85	95	99	1 00	1 41	1 24	1 12	1 16	1 37	1 23	93	90	79	72	?o	583 7	1 21
90	96	1·00	1 05	1 43	1 31	1 11	1 18	1 38	1 11	90	90	89	72	?o	583 8	1 22
17	10	16	15	18	11	09	05	17	34	25	13	14	07	?	93 4	13
·91	1·00	1 05	1·08	1·48	1 31	1 15	1 19	1 45	1 31	1·03	94	86	75	?	626·0	1 27
74	·92	80	76	96	81	1 01	·96	1 01	1·09	1·01	85	·62	5?	?o	315·0	90
,6	85	74	87	88	85	95	·9?	·89	1 02	96	79	5?	50	?o	286 7	84
02	07	06	11	08	04	06	05	12	07	05	06	10	01	?	28 3	06
7o	89	7?	82	9°	83	98	·94	95	1·06	·99	8°	·57	51	?	300·9	87
32	31	28	25	54	43	41	49	61	29	15	13	14	16	?o	114 1	44

MEAN VELOCITIES

[*Instruments*—1"

15TH MILE,

Serial No.	Date 1878 As 187 in 1879.	1	2 DEPTH Above Datum A	Variation	Date of Soundings	Central H	At Solani Aqueduct Gauge	Hyd. Mean. R	Surface Breadth b	Wet Border B	Area A	3 FALL of Water-Surface. Upper 2 miles. F_1	2 miles below Site F_2	Lower 4½ miles F_3	LOCAL SLOPE Left Bank S	Right Bank. s	4 WIND From Direction	From Velocity	To Direction	To Velocity	5 Timekeeper's Initial
191	29 5		15 31	+ 02	28 3	10 99	9 99	9 49	174 9	182 0	1726 8	2 28	3 63	5-54	240	?	NW	1	NE	3	R
Series 192	24-4		14 35	–												Not observed	N	3	.	0	T
	23-4		34	–													.	0	.	0	R
	10 4		33	–													.	0	.	0	T
	29 4		33	–													.	0	.	0	R
	30 4		30	–														0	.	0	T
	1 5		28	– 01														0	..	0	R
δ Range,			07		..	07	10	06	0	1	12 1	05	08	10	033	?	.		.		
v Means of			14 32	..		10 00	8 98	8 64	174 9	180 0	1553	2 26	3 63	4 87	231	?	N	1			
193	8-4		14-03	+ 12	28 3	9-71	8 70	8 39	174 9	179 4	1503 2	2 26	3-64	4 75	228	?		0		0	R
	4-4		13 98	00	„	66	70	3.	9	3	1496-6	2 31	3 59	4 7.	223	?		0		0	T
	29-3		95	00	„	63	70	32	9	2	1491 3	2 34	3-56	4 70	230	?	N	8	NW	7	R
δ Range,			08	..	..	08	00	07	0	2	13 9	03	-08	-05	007	?	.				
v Means of			13 99	..	..	9 67	8 70	8 35	174 9	179 3	1497 7	2 30	3 60	4 73	227	?	NNW	2			
194	15-4		13 7.	– 03	28-3	9 40	8-40	8 12	174 9	178 8	1451 5	2 27	3 63	4 5.	228	?	SW	4	..	0	R
	16-4		48	+ 01	„	16	10	7 91	9	3	1410-0	2 26	3 6.	4 2.	233	?	.	0	.	0	T
δ Range,			24	.	..	24	30	21	0	5	41 5	01	06	30	005	?	.		.		
v Means of			13 60	..	.	9 28	8 25	8 0.	174 9	178 5	1430 8	2 27	3 66	4 40	231	?	SW	1			
193	25-5		12 53	+ 15	28-3	8-21	7-0.	7 13	171 3	174 7	1245 .	2 06	3 ..	3 6.	?	?	.	0	N	4	T

15TH MILE,

	Date.	1	2 A			H		R	b	B	A	3 F_1	F_2	F_3	S	s	4 D	V	D	V	5
196	18 1		15 20	– 03	16-12	9 76	9 83	8-71	186-0	191 8	16 0 3	2 25	3-69	5-43	21.	?	W	3	.	0	R
	13-1		17	+ ·01	„	·3	8.	68	18-.	7	1664	2 21	3 64	5-4.	21.	238	.	0	W	4	S
	20-1		10	00	„	·66	80	·6.	7	·4	16-1	2 25	3 6	5-23	210	23.	.	0	W	3	R
δ Range,			10	.	.	10	·05	08	3	4	18-6	07	07	22	005	700.	.	..	.	..	
v Means of			15-16	..	..	9-72	9-83	8-6.	185-9	191 6	1662 .	2 26	3-6.	5-37	7221		W	1			
197	15-9																				
	15-4		14 63	+ 10	28-4	9-72	9 3.	8-3.	184-.	189 4	1.81 .	2 1.	3 66	5 20	215	22	W	1	W	14	S

AND CUBIC DISCHARGES

TABLE XLIX.

tin Tube Rods]

OLD SITE

6																									7	8
MEAN VELOCITIES past each vertical [Each Value is the mean of three observations																									CUBIC DISCHARGE in cub feet per sec	MEAN VELOCITY
Left of centre												Centre	Right of centre													
Edge	Side slope 84	Side slope 82½	Side slope 80	75	70	65	60	40	20				20	40	60	65	70	75	Side slope 80	Side slope 82½	Side slope 84				D	V
?o	2 42	2 90	3 45	3 61	3 87	4 2–	4 29	4 05	4 55			4 55	4 29	4 29	4 22	3 95	3 85	3 33	3 00	2 83	2 8			?o	7,18	4 19
o	2·08	2 6–	3·00	3 41	3·82	4 00	4 11	4 17	3 66			4 00	4 55	4 35	4 17	4 00	3 47	3 39	2 78	2 48	1 70			o	6,209	4 01
?	26	23	33	16	34	56	52	56	54			70	55	43	61	27	43	43	25	40	38			?	602	39
?	2 05	2 55	2 9–	3·44	3·83	3 93	4·06	3 87	3 97			4 2–	4 26	4 23	4 17	4·01	3·69	3·41	2 71	2 54	1 87			?	6,199	3 98
?o	1 56	2 48	3 19	3 37	3 75	3 8–	4 05	3 95	3 80			4 00	4 22	3 95	4 48	4 00	3 75	3 33	2 65	2 50	1 –8			?o	5 80[illegible]	3 89
?o	1 25	2 36	2 97	3 16	3 80	3 95	4 11	3 70	4 00			4 11	4 11	4 05	3·95	4 00	3 57	3·45	2 88	1 90	1 55			?o	5 771	3 86
?o	90	2 27	2 78	3 41	3 37	3 80	3 95	3 85	3 75			4 05	4 05	4 00	4 11	4 00	3 61	3 33	2 54	2 34	1 90			?o	5 737	3 85
?	66	21	41	25	23	15	16	25	25			11	17	10	53	00	18	12	34	60	35			?	114	04
?	1 24	2 37	2·98	3 31	3 71	3 87	4 04	3 83	3 8–			4·0–	4 13	4 00	4 18	4 00	3 64	3 37	2 69	2 25	1 68			?	5 786	3 87
?o	1 63	2 46	2 89	3 30	4 11	3 85	3 75	4 00	4·00			4 17	4 48	4 00	4 0–	3 75	3 37	3 37	3 53	2 00	2 54			?o	5 711	3 92
?o	97	1 90	2 80	3 33	3 66	3 66	3 75	3 90	3 95			4 17	3 85	4 29	4 11	3 85	3 57	3 26	2 48	2 42	1 74			?o	5 53–	3 93
?	66	56	21	03	45	19	00	10	05			00	63	29	06	10	20	11	05	42	80			?	179	01
?	1 30	2 18	2·70	3 32	3 89	3 76	3 75	3 9–	3 98			4 17	4 17	4 15	4 08	3 80	3 47	3 32	3 01	2 21	2 14			?	5 622	3 93
?o	?	1 44	2 24	2 97	3 26	3 45	3 53	3 45	3 61			3 66	3 57	3 66	4 00	3 61	3 30	3 00	2 36	1 76	1 69			?	4 370	3 51

NEW SITE

6																									7	8
Left of centre												Centre	Right of centre													
Edge	Side slope q	Side slope m	Side slope 80	75	70	65	60	40	20				20	40	60	65	0	75	Side slope 80	Side slope m	Side slope q				D	V
?o	2 46	2 87	3 47	3 61	4 11	4 41	4 32	4 29	4 14			4 44	4 35	4 35	4 32	4 03	3·8–	3 31	3 24	2 70	2 16			?o	6 921	4 14
?o	2 50	2 [illegible]8	[illegible] 70	3 70	4 17	4 69	4 35	4 22	4 35			4 22	4 41	4 29	4 55	4 05	3 70	3 30	3 23	2 75	1 95			?o	6 844	4 11
?o	2 52	2 69	3 33	3 87	4 29	4 20	4 26	4 26	4 25			4 38	4 35	4 29	4 17	4·05	3 9	3 57	3 05	2 79	2 04			?o	6,806	4 12
?	06	18	37	26	18	49	09	07	21			22	06	06	38	02	27	27	19	09	21			?	115	03
?	2·49	2 78	3·50	3 73	4 19	4·43	4·31	4 26	4 2–			4·35	4·37	4·31	4·3–	4·01	3·84	3 39	3·17	2·7–	2·0–			?	6 8–[illegible]	4 12
?o	2 21	2 65	3 13	3 66	3 53	3 95	3 90	3 5–	3 75			4 29	4 29	4 61	4 29	4 17	3 49	3 53	3 49	3·75	2 07			?o	6,28	3·98

MEAN VELOCITIES

BELRA

[*Instruments*—1"

Serial No	1 Date 1879	2 Depth: At Gauge. A	Variation	Date of Soundings.	Central H	Hyd. Mean R	Surface-Breadth. b	Wet Border B	Area A	3 Fall of Water-Surface: Upper 1 mile F_1	Lower 4 miles F_2	Local Slope: Left Bank S	Right Bank S	4 Wind: From Direction	From Velocity	To Direction	To Velocity	5 Timekeeper's Initial
201.	27-3	7 54	− 07	26 3	9·89	9 19	188 5	197·0	1810·6	? 72	4 05	175	18.	..	0	..	0	A
	9 1	50	00	8 1	63	·03	5	196·2	1772 .	?	?	19.	20.	..	0	..	0	A
	10-1	44	− 02	„	57	8 98	4	1	1761·2	?	?	185	200	S	6	..	0	P
	11 1	44	+ 03	„	57	·98	4	1	1761·2	?	?	200	205	S	8	..	0	A
	17 3	29	− 02	19-3	48	93	3	·6	1756 .	67	3 90	180	17.	N	1	N	7	P
δ Range,		23	..	..	41	26	2	9	54 1	?	?	025	030	..	..	..	.	
v Means of δ		7 44	.	..	9·63	9·02	188 4	196 4	1772 4	?·70	?3·96	191		S 1				
Series 202										·66	3 81	170	190	..	0	..	0	A
										?	?	200	220	N	7	NW	.	A
										?	?	205	20.	..	0	..	0	P
										?	?	20.	20.	N	3	NW	4	A
										98	3 59	180	18.	..	0	S	7	P
	23-1	98	00	„	64	71	·0	·4	1702 4	?	?	20.	210	NW	11	NNW	5	A
	„	·94	00	20-1	·60	68	187 9	3	1694 8	?	?	205	210	..	0	..	0	P
δ Range,		26	..	..	48	23	3	1 1	51 1	?	?	035	035	..	.	..	.	.
v Means of δ		7·03	..	..	9 49	8 72	188·0	195 6	1706·0	? 82	?3 70	200		NNW 3				.
Series 203	25-3	6·90											16.	..	0	S	11	P
	20-3	·86	−										18.	..	0	..	0	P
	15 3	83	+										19.	..	0	M	.	P
	16-1	79	+										20.	S	5	..	0	P
	23-2	79	−										1.0	..	0	M	.	A
	14-3	78	−										?	..	0	..	.	A
	25-1	·76											23.	M	1	..	0	P
	23-2	73	−										19(	M	4	M	7	P
	27-1	70											21(	S	1	..	0	A
δ Range,		29	..	..	27	33	·2	7	67	?·63	? 31	030	?07(	..	..	..	.	
v Means of δ		6·80	..	..	9·00	8 47	187 8	19. 3	16.4·(	?·90	?3·51	?191		S 1				.

AND CUBIC DISCHARGES. **TABLE L.**

SITE.

tin Tube-Rods.]

6																	7	8	9
MEAN VELOCITIES past each vertical (Each Velocity is the mean of three observations)																	CUBIC DISCHARGE in cub feet per sec.	MEAN VELOCITY.	SILT in grains per cub foot.
Left of centre.								Centre.	Right of centre.										
Edge	Side-slope m 1 90		80	70	60	40	20		20	40	60	70	80	Side-slope 90 1 m		Edge	D	V	
?	·23	30	·50	·42	·41	·58	·20	·31	62	·20	·40	·43	·42	·18	·67	?	398	·27	?954
?	2 04	2 44	3 02	3 21	3 17	3 21	3 17	3 24	3 33	3 24	3 22	3 14	3·07	2 42	2 04	?	5,611	3 17	?319
[illegible]																			
o In c	2·14	2 28	3 06	2 91	3 26	3·31	3 21	3 43	3 30	3 23	3 13	3 06	2 82	2 55	2 11	o In c	5,425	3 19	129
	2 03	2 48	3 09	2 97	3 14	3 00	3 35	3 23	3 28	3 21	2 96	3 41	3 14	2 32	2 04		5,301	3 13	129
?	·20	·20	·55	·50	·40	31	29	·38	·41	·17	.38	·50	·41	·68	·38	?	282	·19	2918
?	2·02	2 38	2 98	3 16	3 18	3 18	3 25	3 19	3 28	3 22	3·04	3 16	2 92	2 26	2 10	?	5,329	3 12	600
[illegible]																			
?	34	·28	·33	·68	·41	51	·40	·64	·50	·36	59	·37	·41	·79	·42	?	558	·29	948
?	1 95	2·28	2 88	3 05	3 16	3 15	3 15	3 19	3 17	3·24	3 09	3 13	2 83	2 16	1·97	?	5,112	3·09	436

MEAN VELOCITIES

BELAH

[*Instruments*—1"

Serial No.	Date, 1879	1	2 DEPTH: At Gauge. A	Variation.	Date of Soundings	Central H	Hyd. Mean h	Surface-Breadth. b	Wet Border B	Area. A	3 FALL of Water-Surface: Upper 1 mile. F_1	Lower 1 mile. F_2	LOCAL SLOPE: Left Bank. S	Right Bank. S	4 WIND: From Direction.	From Velocity	To Direction	To Velocity	5 Time after Initial.
Series 204	13-3													20	S	1	..	0	F
	21 3													18	..	0	..	0	F
	18-2													205	N	2	..	0	F
	27 2													180	..	0	..	0	A
	22 3													19	..	0	..	0	A
	17-2													210	N	2	N	4	A
	27 2													180	..	0	N	4	F
	20-2													200	..	0	..	0	A
	24 3													190	..	0	..	0	F
	28 1													220	..	0	..	0	F
	28 2													330	..	0	N	5	A
	21 3													205	..	0	N	5	F
	6-2													20		0	N	4	A
	22-2													19	..	0	..	0	A
2 Ranges.		26	..	..	30	20	3	1·1	41 3		83	56	035	150	..	..	..	.	
2 Means of 14		6 49	..	..	8·71	8 21	187 5	194 7	1538·1		72	3·23	198		N 1				
Series 205	7 2													210	..	0	N	4	F
	30-1													220	..	0	..	0	A
	8-2													20	N	2	..	0	A
	4 2													220	..	0	..	0	F
	10-2													205	..	0	..	0	F
	31-1													230	NNW	7	NW	8	F
2 Ranges.		16	..	..	14	28	2	4	41 3		0 35	·40	025	030	..	..	..	..	..
2 Means of 8		6 30	..	..	8 57	7 96	187 3	194 4	1553 2		0·67	3 15	208		NW b N 1				..
Series 206.	3-2														..	0	..	0	A
	7 3														..	0	..	0	F
	8-3														..	0	..	0	A
	9-3														N	2	..	0	A
	11-2														..	0	..	0	F
	3-3														N	6	N	5	O
	13-2														..	0	N	5	A
	4 3														W	2	N	4	F
	11-3														..	0	N	1	A
	14 3														..	0	..	0	A
	10-3														..	0	..	0	F
	15-2														E	5	..	0	F
2 Ranges.		30	..	..	32	31	3	9	63 6		34	70	030	1030	..	..	..	.	
2 Means of 15		5 84	.	..	8 10	7 60	186·8	193 3	1468 8		72	2 74	1200		N b E 1				

AND CUBIC DISCHARGES — TABLE LI.

SITI

tin Tube Rods]

6																	7	8	9
MEAN VELOCITIES past each vertical [Each Velocity is the mean of three observations]																	CUBIC DISCHARGE In cub feet per sec	MEAN VELOCITY	SILT In grains per cub foot.
Left of centre									Centre	Right of centre									
Edge	Side-slope m | 90	80	0	60	40	20			20	40	60	80	Side-slope 90 | m	Edge		D	V	
?	28	47	42	65	61	53	43	47	24	·43	57	38	70	40	44	?	223	20	1203
?	1 91	2 21	2 89	2 91	3·03	3·08	3 13	3·07	3 20	3 15	3 10	2 97	2 80	2 01	1 93	?	4,810	3 01	304
																			241
																			66
																			96
																			561
																			108
																			139
?	30	17	42	24	38	·19	72	26	37	25	31	51	28	33	32	?	108	04	495
?	1 89	2 24	2 98	3 05	3 14	3 18	3 20	3 10	321	3 23	3 11	307	2 68	2 07	1 83	?	4,766	3 07	202
																			99
																			138
																			5233
																			58
																			818
																			81
																			99
																			127
																			48
																			171
																			123
																			219
?	34	42	54	48	·41	31	67	64	37	50	41	52	·31	60	44	?	518	27	51
?	1 75	2 12	2·72	2 88	2 92	3 04	2 97	2 99	3·06	3·06	2 96	2·92	2·64	1·93	1·67	?	4,292	2·9	

MEAN VELOCITIES

JAOLÍ

[*Instruments*—1"

Serial No.	Date 1879	2 DEPTH: At Gauge A	Variation	Date of Soundings	Central H	Hyd Mean R	Surface-Breadth b	Wet Border B	Area A	3 FALL of Water-Surface: Upper ½ mile F_1	Lower 5 miles F_2	Local Slope: Left Bank S	Right Bank S	4 WIND: From Direction	From Velocity	To Direction	To Velocity	Tmekeeper's Initial
Series 211.	27 3	7 32	− 12	26-3	8 61	7 97	192 9	200·6	1599 6	55	5 57	165	16ɔ		0	..	0	S
	7-1	28	− 02	4 1	67	86	8	4	1574 0	36	?	173	183	W	3	V	4	R
	9-1	28	− 05	"	67	86	8	4	1574 0		?	173	18ɔ	V	9	..	0	S
	8 1	28	+ 01		67	86	8	4	1574 0	36	5 58	178	?	V	1	V	4	S
	10-1	25	00		64	83	8	3	1568 2	35	?	183	183	N	4	V	4	R
	11 1	16	·00		55	7ɔ	7	1	1550 8	38	5 46	175	18ɔ	N	6	NE	7	R
	6 1	14	+ 02		53	73	7	1	1546 9	40	5 44	180	17ɔ	E	4	V	1	S
	17-3	10	·00		49	70	7	·0	1539 3	39	?	180	18(	S	5	W	9	S
		07	− 04	19-3	42	82	6	·0	1564·4	32	5 42	150	153	NW	10	W	20	R
δ Range,		25	..	..	25	27	3	6	60 3	23	ɾ 16	033	?030	.		.	.	
ν Means of 9		7 21	.	.	8 58	7 82	192 8	200 2	1565 7	39	?5 49	?174		NW ½ W 2				
Series 212	18 3	6 86								33	5 21	148	15ɔ	W	1	SW	9	R
	21 1	76								33	5 11	165	175	..	0	S	4	S
	24 2	74								33	5 19	150	14ɔ		0	S	13	S
	22-1	68								31	5 13	170	173	NW	7	W	17	R
	23-1	·64								·33	5 09	165	178	NW	4	W	2ɔ	S
	25-2	60								27	5 10	143	148	..	0	N	8	R
δ Range		26			23	28	2	7	58 8	06	12	027	033	..	.	..	.	
ν Means of 6		6 71	.	.	8 11	7 46	192 3	199·2	1485 4	32	5 14	160		W ½ S 5				
Series 213	25-2									30	5 12	143	148	N	6	NW	6	S
	17 1									3ɔ	4 99	158	?	W	11	W	14	R
	25 3									31	5 08	160	158	E	17	E	1	S
	15-3									29	4 95	140	143	SW	5	W	ɔ	R
	16 1									32	5 00	163	168	.	0	V	4	S
	18-2	33	00	19 2	68	17	9	3	1421 4	26	4 28	143	130	N	4	N	8	S
	17 2	31	+ 02	"	66	15	9	3	1417 4	23	4 16	140	143	N	6	W	4	R
δ Range,		·26	.	.	57	38	2	6	79 9	12	96	025	?038	..	.		.	
ν Means of 7		6 45	.	..	7 73	7 22	192·0	198 6	1434 6	29	4 80	?148		N ½ W 2				
Series 214	20-3									28	4 94	145	160	W	8	W	11	S
	25-1									33	4 76	140	15ɔ	W	6	W	1	R
	27 2									24	4 28	13ɔ	148	W	10	NW	1ɔ	S
												135	148	W	10	NW	20	R
	20-2									23	4 8ɔ	133	125	NW	16	W		R
	28-2									25	4·84	143	143	NW	10	W	3ɔ	S
	27 1									32	4 8?	150	158	E	6	E	ɾ	S
	13-3	11	+ 32	12-3	6?	7·06	7	·0	1397 0	28	4 86	163	15ɔ	..	0	N	11	R
δ Range,		18		..	14	16	1	4	33 2	09	66	030	035	.		.	.	
ν Means of 8		6 21	..	..	7·61	7·0ɔ	191 8	198·0	1395 6	28	4 70	146		WNW 9				

AND CUBIC DISCHARGES.

TABLE LII.

SITE

tin Tube-Rods]

6 — MEAN VELOCITIES past each vertical (Each Velocity is the mean of three observations)																					7 — CUBIC DISCHARGE in cub. feet per sec	8 — MEAN VELOCITY
Left of centre											Centre.	Right of centre.										
Edge	Side-slope 96	Side-slope 92½	87½	82½	75	67½	60	40	20			20	40	60	67½	75	82½	87½	Side-slope 92½	Side-slope 96	Edge	D	V
																						4,754	2 97
																						4 634	2 93
																						4 671	2 97
																						4 813	3·06
																						4 660	2 97
																						4 643	2 99
																						4 590	2 97
																						4 416	2 87
																						4,493	2 87
?	·34	26	38	24	53	38	33	27	25	50		41	32	42	20	43	44	27	·35	40	?	397	19
?	2 01	2 21	2 41	2 73	3 0o	3·10	3 08	3 06	3 09	3 05		3·03	3 02	2 99	2 94	2 98	2·58	2 30	2 03	1 89	?	4,631	2 96
																						4,384	2 88
																						4 478	3 01
																						4 330	2 90
																						4,488	3 05
																						4 328	2 95
																						4,135	2 82
?	38	30	43	45	30	51	32	36	51	51		39	35	46	41	62	26	12	·11	26	?	353	23
?	1 94	2 16	2 38	2 71	2 86	3 01	3 05	3 13	3 06	3 05		3 01	3 09	2 89	2 88	2 6?	2·39	2 16	1 90	1 74	?	4,357	2 94
																						4,19?	2 87
																						4,201	2 94
																						4,20?	2·91
																						4,14?	2 82
																						4,0?	2 98
																						4 00?	2·82
Edge	1 73	2 01	2 40	2 48	2·61	2 65	2 94	2 86	2 97	2 97		3 09	3 03	2 70	2 54	2 48	2 10	1 83	1 66	1 41	Edge	3,923	2 77
?	26	35	51	30	42	50	25	51	29	35		31	33	31	28	36	34	38	40	43	?	286	21
?	1 88	2 07	2 32	2 60	2 83	2 85	2 9?	3·07	2 96	3 04		3·04	3·01	2 7?	2·65	2 6?	2 32	2 02	1 83	1 68	?	4,10?	2 87
																						3 98?	2·82
																						4 02?	2·89
																						3 92?	2·81
																						3 90?	2 79
																						3,84?	2 74
																						3 84?	2 77
																						3,97?	2 87
																						3,94?	2·82
?	37	23	47	·46	38	38	35	42	37	44		39	·43	47	50	51	33	28	13	26	?	184	15
?	1·83	1 95	2 31	2 63	2·61	2 94	2·90	3 02	2 93	2 94		2 93	3·00	2·78	2·60	2 49	2·17	1 94	1 75	1·61	?	3,92?	2·81

MEAN VELOCITIES

JAOLI

[*Instruments—1"*

AND CUBIC DISCHARGES

TABLE LIII.

SITE

tin Tube Rods

6																											7	8
MEAN VELOCITIES past each vertical [Each Velocity is the mean of three observations]																											CUBIC DISCHARGE in cub feet per sec.	MEAN VELOCITY
Left of centre												Centre	Right of centre															
Edge	Side-slope m	1	½	87½	82½	75	67½	60	40	20			20	40	60	67½	75	82½	87½	Side-slope ½	1	m	Edge				D	V
																											3 922	2 88
																											3 701	2 70
																											3 706	2 76
																											3 758	2 76
																											3 876	2 8[illegible]
																											3 787	2 95
																											3 640	2 73
																											3 707	2 83
																											3 660	2 68
																											3,617	2 77
?	28	40	33	24	39	45	33	56	41	35		36	20	42	45	37	41	40	22	20			?				355	27
?	1 76	1 88	2 18	2 57	2 78	2 87	3 01	2 92	3 00	2 93		2 97	2 99	2 74	2 60	2 48	2 18	1 99	1 72	1 59			?				3,740	2 80
																											3 62[illegible]	2·84
																											3 68[illegible]	2 84
																											3,684	2 73
																											3,82[illegible]	2 57
																											3,37[illegible]	2 62
																											3 41[illegible]	2 69
																											3 491	2 72
																											3 360	2 64
																											3,69[illegible]	2 68
?	33	33	32	41	49	36	48	51	40	45		38	32	23	34	44	59	35	31	32			?				36[illegible]	27
?	1 70	1 93	2 21	2 47	2 59	2 82	2 87	2 83	2 87	2 91		2 93	2 91	2·66	2 44	2 27	2·05	1 85	1 69	1 44			?				3,47[illegible]	2 70
																											3,24[illegible]	2·60
																											3,292	2 64
																											3,294	2 64
																											3 290	2 64
																											3,233	2 61
																											3,202	2 64
?	31	23	16	29	22	39	34	42	37	24		30	34	32	27	23	32	31	27	31			?				92	04
?	1 67	1 79	2 04	2·38	2·44	2 60	2 74	2 87	2 87	2 84		2 83	2·84	2 45	2 29	2 14	1 89	1 66	1·06	1 43			?				3,20[illegible]	2·63

MEAN VELOCITIES

KAMBERRA

[*Instruments*—1"

Serial No	Date 1879	2 DEPTH: At Gauge A	Variation	Date of Soundings	Central H	Hyd Mean R	Surface Breadth b	Wet Border B	Area A	3 FALL of Water-Surface: Upper 2¼ miles F_1	Lower 8½ miles F_2	LOCAL SLOPE: Left Bank. S	Right Bank S	4 WIND: From Direction	From Velocity	To Direction	To Velocity	5 Timekeeper's Initial
221	6 2	6 56	+ 03	5 2	5 66	4·91	65 6	69 8	342	2 82	11 89	294	286	NNW	18	NNW	15	cl
	7 2	51	00	"	61	87	5	6	339 (	2 8ɔ	11 84	299	294	N	13	N	8	c
	4-2	44	02		54	82	4	4	334 ɔ	2 79	11 78	303	291		0	V	7	c
	3-2	34	− 02		44	74	ɔ	2	327 J	2 87	11 68	306	289	NNW	12	NW	7	cl
δ Range,		22			22	17	2	6	14 4	08	21	012	008					
v Means of 4		6 46			5 ɔ6	4·84	65·5	69 5	336·0	2·83	11 80	295		NNW 9				
Series 222	20-3	6 21	− 01	19 3	5 74	4 76	66 3	69 9	332 9	2 8°	11 69	274	260	N	11	N	11	cl
	31 1	20	+ 01	29 1	°8	62	6ɔ 4	1	318 8	2 93	11 6ɔ	°96	277	NNW	10	N	2	c
	30 1	15	00	"	23	58	3	68 9	31ɔ ɔ	2 98	11 61	301	277		0	NW		cl
	27 1	14	00	"	22	·57	·3	9	314	2 89	11 58	291	27°	V	1		0	cl
	28 1	12	00		20	·55	3	8	313 6	3 01	11 ɔ8	301	294		0	V	1	c
	2ɔ 1	11	00	20 1	36	54	4	8	312 4	2 92	11 54	291	276	NNW	9	NNW	10	c
	4 1	03	00	1 1	27	47	0	4	30ɔ 6	3 00	11 49	308	286		0		0	c
		02	00		26	46	·0	4	30ɔ °	3 02	11 48	308	286		0	V	1	c
	3-1	·02	00		26	46	0	4	30ɔ	3 01	11·48	313	291	NNW	7	NNW	11	cl
	1ɔ-1	00	00	13-1	°4	42	0	4	301 6	3·03	11 56	311	28		0	•	0	cl
		·01	+ 02	"	2ɔ	42	1	4	30° 4	3 12	11 ɔ7	311	28°		0	V	1	c
	17 1	01	− 02		13	42	1	4	302 4	2 97	11 47	301	°62	N	10	N	18	cl
		00	00		11	4°	·0	4	301 6	2 98	11 46	301	°6°	N	1ɔ	N	21	c
	9-1	5 99	− 02	1 1	23	44	64·9	3	303 °	2 94	11 50	308	28ɔ		0		0	cl
	10-1	98	− 01	1 1	°°	43	9	·3	30 6	2 9ɔ	11 48	316	299	V	1	V	1	c
δ Range,		23			63	34	1 4	1 6	31 1	30	23	042	039					
v Means of 3		6·07			5 27	4 ɔ0	6ɔ °	68 7	309 °	2·97	11 54	291		N b W 6				
Series 223	14 1	5 93	− 01	13-1	5 17	4 36	64·9	68 2	297 °	3·00	11 49	303	287	N	13	N	13	cl
		92	00		16	3ɔ	9	1	296·6	2 99	11 48	303	28	NW	10	NW	6	c
	21-3	·8ɔ	00	19 3	42	5°	65 5	9	311 8	2 99	11 45	296	279	N	13	N	1ɔ	c
	2 -3	88	00		41	ɔ2	5	9	311	2·60	11 38	296	27°	NW	12	NW	11	cl
	8 2	80	00	5-2	4 90	33	64 3	67 7	293·0	2 ·8	11 36	311	306	V	1	N	7	cl
	2ɔ 3	7ɔ	− 01	26-3	5 13	40	8	68·3	300·4	° 63	10·71	291	279	E	9	E	ɔ	cl
	27 2	7ɔ	− 01	26 2	4 94	34	6	1	29ɔ·ɔ	2 90	11 07	306	301	NW	8	NW	11	c
		7	00	"	93	33	6	1	294	2 91	11 06	306	301	NW	8	NW	11	cl
	23 2	72	00	"	93	33	·6	1	294	·81	10 93	294	308	NW	10	NW	11	c
	18-1	71	00	13-1	·82	19	4	67 ɔ	283 0	2·96	11 27	318	306	N	1ɔ	N	10	cl
	24-3	6ɔ	+ 02	26-3	5·07	·35	8	68·1	296·ɔ	2 64	11 3ɔ	294	28°	NW	11	NW	10	c
δ Range,		24		•	60	33	1 2	1 4	28·8	40	78	027	030					
v Means of 3		5·79			5·08	4·37	64 8	68 2	29·	2 84	11 24	297		NNW 9				

AND CUBIC DISCHARGES **TABLE LIV.**

SITE

tin Tube Rods]

6																				7	8
MEAN VELOCITIES past each vertical [Each Veloc ty is the mean of three observations]																				CUBIC DISCHARGE in cub. feet per sec	MEAN VELOCITY.
Left of centre.									Centre	Right of centre.											
Side-slope m	Side-slope 1 2½	25	22½	20	15	10	5		5	10	15	20	22½	25	Side-slope 27½	Side-slope m	Edge			D	V
																				981 6	2 87
																				967 0	2 85
																				948·0	2 83
																				945 8	2 88
	15	36	09	38	21	39	50	·42	43	35	22	33	14	50	18	41	·15	?		35 8	05
	1 9	2 47	2 74	2·96	2 9	3 07	2 93	2 88	3 09	2 84	3 07	3 01	3 06	2 98	2 74	2 39	1 93	?		960 6	2 86
																				908 6	2 72
																				921 4	2 89
																				899 6	2 85
																				896 6	2 85
																				877 0	2 80
																				879 8	2 82
																				863 7	2 82
																				862 7	2 83
																				898 7	2 94
																				834 6	2 77
																				845 0	2 79
																				862 6	2 85
																				859·2	2 85
																				830·5	2 74
																				824 6	2 73
?	58	38	49	55	53	50	62	55	51	52	46	34	53	39	48	49	68	?		96 8	22
?	1 77	2 33	2 71	2 8	2 82	2 87	2 88	2 92	2 94	2 94	2 98	3·00	2 98	2 88	2 68	2·42	1 93	?		871·0	2 82
																				875 2	2·94
																				847	2 86
																				838 4	2 [illegible]
																				8C2	2·77
																				841	2 87
																				817 [illegible]	2·78
																				823	2 79
																				817·7	2·78
																				817 [illegible]	2·77
																				803·1	2 84
																				8[illegible] [illegible]	2·[illegible]
?	90	46	52	38	44	52	70	28	56	37	79	48	45	38	44	·52	66	?		75 [illegible]	26
?	1 72	2 35	2 77	2 80	2·78	2 87	2·90	2 93	2 88	2 94	2 92	2 93	2 91	2 87	2·64	2 32	1 82	?		821 [illegible]	2·79

MEAN VELOCITIES

KAMPERA

[*Instruments*—1″

Serial No.	Date 1879	1	2								3				4				5
			Depth.				Surface Breadth	Wet Border	Area		Fall of Water-Surface				Wind.				
			At Gauge	Variation	Date of Soundings	Central	Hyd Mean				Upper 2½ miles	Lower 8½ miles	Local Slope		From		To		Time-keeper a Initial
													Left Bank	Right Bank	Direction	Velocity	Direction	Velocity	
			h			H	R	b	B	A	F_1	F_2	S	S					
Series 224.	21 1	5 61	00	20 1	4 86	4 16	64 3	67 3	280·0		2 05	11 22	316	303	.	0	.	0	c
	22 1	61	00		86	16	3	3	280 0		2 02	11 25	313	301	N	13	N	15	cl
	10 2	55	00	12 2	84	17	2	4	281 2		2 78	11 16	316	306	V	2	V	2	c
	11 2	55	00	,	84	17	2	4	281		2 78	11 21	313	301	..	0	V	1	cl
	4-3	55	·00	5-3	80	23	5	·8	286 0		2 73	11·05	303	311	V	1	NW	15	cl
	22 2	54	00	19-2	84	24	4	·8	287 1		2 79	11 18	308	291	..	0	.	0	c
	27 3	54	00	26 3	99	23	·4	7	286 8		2 69	11 10	301	277	..	0	..	0	c
	13-2	53	00	12 2	82	16	·1	3	279 0		2 80	11 16	313	294	N	14	N	14	c
	3-3	53	00	5 3	78	22	5	7	285 6		2 70	11 00	303	311	NW	19	NW	17	cl
	24-2	·47	·00	26 2	68	14	1	3	278 0		2 74	11·07	306	299	..	0	V	2	cl
	25-2	45	00	,,	66	12	0	3	277 3		2 78	11·00	306	299	..	0	V	1	cl
	,,	·45	00	,,	·66	12	·0	3	277·3		,,	,,	306	299	..	0	V	1	c
δ Range,		16	..	..	26	·12	·5	5	9 8		26	25	015	034	..	..	..	.	
t° Means of 11		5 53	.	..	4 80	4 18	64 3	67 5	281 8		2 79	11 12	304		NNW 4				
Series 225.	14-2	5·41	·00	12 2	4 70	4 07	63 9	67·0									.	.	
	8 3	41	+ 01	5-3	66	12	64 2	4							..		..		
	18-2	40	00	19 2	70	13	1	3									.	.	
	17 2	39	00	,	69	·12	1	3											
	10-3	37	- 02	12 3	48	09	1	3											
	13 3	36	00	,,	47	·05	1	2							.		.		
	11 3	35	00	,,	·46	·08	1	2											
	7 3	33	00	5-3	58	·06	1	2							..			.	
	15-2	32	00	12 2	61	·09	63 7	66 7											
	17 3	·31	- 01	19 3	84	08	64 1	67 1											
	15 3	30	00	12 3	·41	01	63·9	·0											
	20-2	28	00	19-2	·38	·04	,,	·0											
	6-3	28	00	5-3	53	02	64·0	·0							.				
	18-3	27	- 02	19 3	80	·00	1	·0	·71		- 71	10·33	·000	291	..	0	V	1	cl
δ Range,		14	..	..	43	13	,,	7	11		13	82	024	020	..	..	..	.	
t° Means of 11		5·31	..	..	4 61	4·04	64·0	67 1	273		2 79	10 64	30·		N b W 3				

AND CUBIC DISCHARGES

TABLE LV.

SITE

in Tule Rods]

6																						7	8
MEAN VELOCITIES past each vertical (Each Velocity is the mean of three observations)																						CUBIC DISCHARGE In cub feet per sec	MEAN VELOCITY
Left of centre								Centre	Right of centre													D	V
Edge	Side-slope 2½ 1 m	25	22½	20	15	10	5		5	10	15	20	22½	25	Side-slope 2½ 1 m	Edge							
																						774 0	2 76
																						794 0	2 84
																						768 0	2 73
																						772 4	2 73
																						797	2 78
																						809 0	2 82
																						7o4 5	2 63
																						785 7	2 81
																						780 2	2 73
																						744 1	2 67
																						747	2 70
																						745 1	2 69
?	57	67	35	40	40	69	41	33	28	33	41	50	35	36	27	56	69	?				64 9	21
?	1 66	2 24	2 67	2 74	2 79	2 83	2 84	2 90	2 91	2 88	2 88	2 87	2 80	2 74	2 52	2 18	1 63	?				772	2 74
																						746 2	2 74
																						734 1	2 64
																						760 7	2 74
																						776	2 80
																						743	2 70
																						736	2 68
																						747 7	2 73
																						733 6	2 69
																						739	2 68
																						738 8	2 69
																						725 8	2 68
																						737 8	2 73
																						711 4	2 64
																						719 4	2 65
?	64	43	52	29	35	60	54	58	54	39	55	31	30	31	31	26	26	?				65 5	16
?	1 60	2 17	2 60	2 67	2 72	2 83	2 79	2 85	2 77	2 80	2 81	2 86	2 89	2 78	2 55	2 19	1 54	?				739 4	2 71

AVERAGE CROSS-SECTIONS, MEAN VELOCITIES AND CUBIC DISCHARGES. TABLE LVI.

Sites in Distributaries

[*Instruments*—11′ *Sounding Rod, and* 1″ *tin Tube-Rods*]

Serial No.	Date, 1879	Depth: At Gauge A	Depth: Variation	Depth: Date of Soundings	Depth: Central H	Depth: Hyd Mean R	Depth: Surface-Width s	Depth: Wet Border B	Depth: Area A	3 Fall of Water-Surface	4 Wind: From Direction	4 Wind: From Velocity	4 Wind: To Direction	4 Wind: To Velocity	5 Timekeeper's Initial	6 Nature of work	6 Left of centre: Edge	10	8	6	4	2	6 Centre	6 Right of centre: 2	4	6	8	10	Edge	7 Cubic Discharge in cub feet per sec D	8 Mean Velocity V	9 Site
	28-3	3 11	·00	28-3	2 58	2·00	22 0	23 5	46 9	?	..	0	..	0		Depths *Range		97 1 1	2 25 3	2 40 4	2 47 3	2 57 4	2 58 5	2 52 2	2 48 1	2 40 0	2 07 1 0	80 1 4	..	..	..	
231.	29-3	4 30	·00	28 3	3 82	2 79	25 0	27 2	76 0	?	..	0	..	0	C																
	"	34	+ 02	"	·81	·79	0	2	75·8	?	..	0	..	0	B																
	Range,	01	..	..	01	00	·0	0	2	.	..	0	..	0	.	Velocities	?o	1 96	2 36	2 50	2 73	2 73	2 73	2 78	2 80	2 65	2 36	1 96	?o	190 7	2 51	
	Means of 2	4·30	..	..	3·82	2 79	25·0	27 2	75 9	.	Calm				.		?o	1 99	2 36	2 54	2 86	2 73	2 61	2 70	2 73	2 63	2 48	2 21	?o	191 1	2 52	
																	?	03	·00	04	·13	00	12	08	07	·02	12	25	?	·4	·01	
																	?	1 98	2 36	2 52	2 80	2 73	2 67	2 74	2 77	2 64	2 42	2 09	?	190 9	2 52	
232	28-3	3 10	- 02	28-3	2 57	1 99	22 0	23 4	46 6	?		0	..	0	C																
	"	·09	·00	"	56	98	·0	4	4	?	..	0	..	0	B																
	Range,	01	..	..	·01	01	0	0	·2	..	..	0	..	0		Velocities	?o	1 60	1 73	2 13	2 17	2 31	2 40	2 33	2 11	2 11	1·96	1 63	?o	97 7	2 10	
	Means of 2	3 10	..	..	2 57	1 99	22·0	23 4	46 5	.	Calm				.		?o	1 53	1 82	1 99	2 26	2 38	2 24	2 26	2 26	1·96	2 04	1 58	?o	97 7	2 10	
																	?	07	09	14	09	07	16	07	15	15	08	05	?	0	00	
																	?	1 57	1 78	2 06	2 22	2·35	2 32	2 30	2 19	2 04	2 00	1 61	?	97·7	2 10	

RIGHT JAOLI DISTRIBUTARY, Gauge on Right Bank 100 below Site

Date,	A			H	R	s	B	A		D	V	D	V			Left of centre: Edge	6	5	4	3	2	1	Centre	Right of centre: 1	2	3	4	5	6	Edge	D	V	
12 3	3·60	·00	12-3	3·08	2 10	13 8	16·9	33·5	?	..	0	..	0	.	Depths, *Range,	..	? ?	2 73 6	3 12 2	3 10 2	3 12 2	3 10 2	3 08 1	3 08 3	3 07 2	3 07 ·1	3 05 3	2 08 3	1 87 1 2		..	..	
18-3	3·85	·00	18-3	3 38	2 28	14 0	17 4	39 7	?	..	0	..	0		Depths, *Range,	.	1 50 9	3 22 4	3 38 2	3 40 2	3 42 2	3 17 1	3 38 2	3 37 3	3 35 4	3 32 3	3 23 1	2 92 3	1 30 2 1	.	..	..	

DISTRIBUTARY, 30 below Site.

233	13-3	4·08	+ 05	12-3	3 56	2 35	14 3	18 0	42 2	Not observed	‥ 0	‥ 0	B	Velocities	?0	1 56	1 92	2·05	2 27	2 41	2 46	2 48	2 52	2 22	2 17	2 11	1 85	1 49	?0	90·5	2 14	MANSURPUR, Gauge on Right Bank.
	,,	05	− 15	,,	53	33	3	17 9	41 8		‥ 0	N l	C		?0	1 58	2 07	2 17	2 38	2 52	2 59	2 36	2 36	2 17	2 08	2 00	1 70	1 41	?0	89 5	2 14	
	18 3	3 90	+ 06	18-3	43	31	0	5	40 4		. 0	‥ 0	C		?0	1 79	2 03	2 10	2 22	2 31	2 27	2 33	2 29	2 11	2 17	2 05	1 85	1 28	?0	84 9	2 10	
	,,	83	00	,,	38	28	0	4	39 7		‥ 0	‥ 0	B		?0	1 58	1 83	2 04	2 13	2 36	2 34	2 26	2 27	2 11	2 03	1 9	1 78	1 19	?0	80 6	2 03	
	δ Range	23	‥	‥	18	07	3	6	2 5	?	‥ ‥	‥ ‥	.		?	23	24	13	25	21	32	22	25	11	14	20	15	30	?	9 9	11	
	v Means of 4	3 97	‥	‥	3 48	2 32	14 2	17 7	41·0	?	N l		.		?	1 63	1 96	2 00	2 25	2 40	2 42	2 36	2 36	2 15	2 11	2 02	1 80	1 35	?	86 4	2 10	
234	12 3	3 60	00	12 3	3 08	2 10	13 8	16 9	35 5	?	‥ 0	‥ 0	C	Velocities	?0	1 36	1 92	1 99	2 16	2 34	2 29	2 29	2 26	2 19	2 04	1·97	1 85	1 38	?0	72 0	2 05	
	14-3	4 10	·00	14 3	2·43	1 85	14·0	16 7	30 9	?	‥ 0	‥ 0		Depths *Range,	.	2·03 5	2 37 3	2 37 2	2 42 2	2 40 3	2 45 3	2 43 2	2 40 2	2 43 3	2 40 4	2 43 4	2 48 3	2 08 8	‥	‥ ‥	‥	MIRANPUR DISTRIBUTARY, 1 Mile below head, Gauge on Left Bank 3 miles below Site
235	14·3	3 75	− 70	14-3	2·08	1·63	14·0	15·9	26·0	?	‥ 0	‥ 0	B	Velocities	?0	1 75	1 80	1 78	1 92	1 76	1 65	1 67	1 58	1 55	1·38	1 29	1 35	1 34	?0	41 4	1 59	
	21 3	2 83	00	21 3	1 40	1 16	13 5	14·6	17 0	?	‥ 0	W l		Depths *Range,	. .	72 8	1 37 ·3	1·37 2	1 37 ·1	1 38 1	1 42 1	1 40 2	1 38 1	1 38 1	1 35 1	1 35 1	1 40 2	1 12 ·8	.	‥ ‥	‥ .	
236	21 3	2 83	00	21-3	1 40	1 16	13 5	14 6	17 0	?	W l	W l	B	Velocities	?0	1 22	1 48	1 44	1 55	1 54	1·60	1 58	1 65	1 54	1 49	1 44	1 39	1 30	?0	25 3	1 49	
	,,	2 83	+ ·01	,,	40	16	5	6	0	?	NW b	NW b	C		?0	1 32	1 53	1 55	1 58	1·64	1·63	1 60	1 54	1·55	1 53	1 46	1 43	1·35	?0	25·7	1·49	
	δ Range,	00	‥	‥	00	00	00	0	0		‥ ‥	‥ .			?	10	05	11	03	·10	·03	·02	·11	01	04	·02	04	05	?	4	00	
	v Means of 2,	2 83	‥		1 40	1 16	13 5	14 6	17·0	‥	WNW b				?	1 27	1 51	1 50	1 57	1 59	1 62	1 59	1 60	1 55	1 51	1 45	1 41	1·33	?	25 5	1 40	
	19-3	3 75	00	19-3	3 33	2 15	13 0	15 9	34·0	?	‥ 0	‥ 0	‥	Depths *Range,	.	? ?	2 41 8	3 05 3	3 27 4	3 33 4	3 32 4	3 33 3	3 35 3	3 32 3	3 15 2	2 72 5	1 55 10	? ?	‥	‥ ‥	‥ ‥	PIMORA DISTRIBUTARY, Gauge on Left Bank, 143' below Site.
237	19-3	3 79	− 01	19 3	3 37	2 16	13 0	16 0	34 5	?	NW b	W l	C	Velocities	?0	?	1 63	1 86	1 80	1 92	2 05	2 13	2 03	1 91	1 76	1 73	1 38	?	?0	62 8	1 82	
	,,	78	+ 06	,,	36	16	0	15 9	4	?	NW l	NW l	B		?0	?	1 70	1 84	1 90	1 96	2 00	2 08	1 97	1 99	1 82	1 75	1 46	?	?0	63 3	1 84	
	δ Range,	01	‥	‥	01	00	0	1	1	.	‥ ‥	‥ ‥			?	?	07	02	10	04	05	05	06	08	06	·02	08	?	?	5	02	
	v Means of 2,	3 79	‥	‥	3 37	2 16	13 0	16 0	34 5		NW b				?	?	1 67	1·83	1 80	1 94	2 03	2 11	2 00	1 95	1 79	1 74	1 42	?	?	63 1	1 83	
238	20-3	3 37	− 02	19 3	2 95	1 96	12 5	14 9	29 2	?	‥ 0	W l	B	Velocities	?0	?	1 53	1 68	1 76	1 94	2 08	2 03	2 04	1 89	1 65	1·62	1 33	?	?0	52 2	1 79	
	,,	28	− 06	,,	86	91	5	7	28 0	?	W l	W l	C		?0	?	1 49	1 55	1 68	1 83	1 86	1 92	1 90	1 83	1 73	1 52	1·25	?	?0	47 9	1 71	
	δ Range	09	‥	‥	09	05	0	2	1 1	.	‥ ‥	‥ ‥			?	?	04	·13	08	11	22	11	14	06	08	10	08	?	?	4 3	08	
	v Means of 2	3 33	‥	‥	2 91	1 94	12 5	14 8	28 0		W l		.		?	?	1 51	1 62	1 72	1 80	1 97	1 98	1 97	1 86	1 69	1 57	1 29	?	?	50 0	1 75	

SURFACE, BED AND MEAN VELOCITIES AND DISCHARGES. TABLE LVII.

Soláni Right Aqueduct

[Instruments—3″ Surface-Floats, 3″ Double-Floats, and 1″ wood Rods]

For explanation of this Table see pages 57 67 Series 241 is a reprint from Nos. 54 55; Series 242 from No. 66, Series 243 partly from No. 111; the work of 16-2-.6 in Series 243 is new matter

Serial No.	1 Date, 1872.	2 Depth. Central. H	Variation.	Hyd. Mean. R	Surface-Breadth. b	Length of Instrument. l	3 Fall of Water-Surface. Upper 5 miles. F_1	Lower 41 miles. F_2	4 Wind. From Direction.	From Velocity.	To Direction.	To Velocity.	5 Timekeeper's Initial	6 Surface, Bed and Mean Velocities taken in succession past each vertical. Series 241, at the surface; Series 242, about 10¼″ above the bed; Series 243, Rod velocities (Each Velocity is the mean of three observations). Left of centre. 42½	40	37½	35	32½	30	20	10	Centre	Right of centre 10	20	30	32½	35	37½	39½	42½	7 Discharge past each Transversal in cu. ft. per sec. D	8 Mean Velocity past each Transversal U_o V U_B	Transversal.
241	19 2	8 93	+ ·08	7 41	83·7	..	5 75	5 00	SW	4	NW	15	H	?o	3 03	3 39	3 51	3 95	4 11	4 14	4 14	3 97	4 20	4 22	4 05	3 49	3 24	3 13	2 65	?o	325·2	3 8₃	
	18 2	8 78	+ ·05	7 30	83·9	.	5 92	4 88	..	0	SSW	23	W	?o	3 09	3 82	3 64	3 97	4 0₅	4 0₅	4 11	4 05	4 17	4 05	3 59	3 26	3 16	3·01	2 59	?o	320 9	3 78	
δ Range,		·17	..	·11	2	..	·17	·12	..	..	..	..	..	?	06	·13	13	02	06	·09	03	·08	·03	·17	·46	·23	08	·12	·06	?	4·3	·05	
v Means of 2.		8 87	..	7 36	83 8	..	5 84	4·94	SW	δ	W	7	..	?	3 06	3 61	3 58	3 96	4 08	4 10	4 13	4 01	4 19	4·14	3 82	3 38	3 20	3 07	2 62	?	323 0	3 81	SURFACE
242	19 2	8 93	+ ·08	7 41	83 7	8	5 75	5 00	SW	4	NW	15	H	?o	2·97	3 49	3 37	3 59	3 66	3 70	3 64	3 70	3 75	3 75	3 64	3 33	3·11	3 16	2 50	?o	298·2	3 51	
	18 2	8 78	+ ·05	7 30	83 9	8	5 92	4 88	..	0	SSW	23	W	?o	3 14	3 31	3 43	3 68	3 5¹	3 73	3 8₅	3 57	3 8₅	3 70	3 55	3 24	3 35	2 83	2 78	?o	295 5	3 48	
δ Range,		·17	..	11	·2	0	·17	·12	..	..	..	..	..	?	·17	·18	06	09	15	·03	·21	·13	·10	·05	·09	·09	·24	33	28	?	2·7	·03	
v Means of 2		8 87	..	7 36	83 8	8	5·84	4 94	SW	δ	W	7	..	?	3·06	3 40	3 40	3 64	3 59	3 72	3 75	3 64	3 80	3 73	3 60	3 29	3 23	3·00	2 64	?	296·9	3 50	BED,
243	19 2	8 93	+ ·08	7 41	83·7	8	5 95	5 00	SW	4	NW	15	H	?o	3 25	3 75	3 75	3·85	3 92	3·90	3 97	4 00	4 17	4 05	3 97	3 66	3 41	3 33	2·91	?o	321 5	3 79	
	18·2	8 78	+ ·05	7 30	83·9	8	5·92	4 88	..	0	SSW	2₀	W	?o	3 33	3 53	3 97	3 8₂	3 8₅	3 8₂	4 11	4 05	4 14	3·90	3 73	3 66	3 41	3 28	3 21	?o	318 8	3 75	
δ Range,		·17	..	·11	·2	0	·17	·12	..	..	..	..	..	?	·10	·22	·22	03	07	03	·14	·05	03	·15	·24	·00	·00	·05	30	?	3 0	·04	
v Means of 2		8 87	..	7·36	83·8	8	5 84	4 94	SW	δ	W	7	..	?	3 28	3 64	3 86	3 84	3·89	3 86	4 01	4·03	4 16	3 98	3·85	3·66	3 41	3 31	3 06	?	320 3	3 77	MEAN.

TABLES LVIII.—LXX.

Central Surface and Mean Velocities.

Solání Left Aqueduct Site, ...	Series	101 to 107,	Table LVIII.
Solání Right Aqueduct Site, ...	„	108 to 127,	Tables LIX —LXI.
Solání R Aqueduct (with L. Aqued. closed),	„	131 to 139,	„ LXI.
Solání Embankment Main Site, ...	„	151 to 181,	„ LXII.—LXIV.
Fifteenth Mile Sites, ...	„	191 to 197,	„ LXV.
Belra Site, ...	„	201 to 206,	„ LXVI, LXVII
Jaolí Site, ...	„	211 to 217,	„ LXVII, LXVIII
Kamhera Site, ...	„	221 to 225,	„ LXIX.
Distributaries, ...	„	231 to 238,	„ LXX.

column, viz —

δ, "Range" (*i.e.*, difference between the greatest and least) of the quantities in the Sub-column.

v, Mean of the quantities in the Sub-column.

[*N B* —Col. 4 is incomplete in many Series (in the Roorkee Reach) the "Means" in this Column are in such cases queried (?) as not being strictly comparable with the rest (though otherwise correct in themselves)].

Explanation of the Columns.

Col.	Head.	Symbol	Detail.	
2	State of Regulation.	Q	Number of Gates and of Ogees (small Gates) open in Dhanauri Dam.	controlling Supply into Roorkee Reach.
		k	Number of Gates closed in Dhanauri Regulator.	
			Withdrawal by Distributaries near Tail of Reach, in cub. ft. per sec.	
		F_1	Average Height of (temporary) Obstruction across Falls at Tail of Reach (*i. e.*, sum of heights of obstructions in each bay of the Falls — num	controlling exit at Tail of Reach.
		F_2		
		F_3		
3	Rod Velocity Results	R	[illegible]	[illegible] of ach.
		s		
		i		
		D		
		V	Mean (Sectional) Velocity, *i. e.*, the quotient D — A.	
[illegible]			[illegible]	incomplete *many cases* in Roorkee Reach].
[illegible]			[illegible]	ope not ed in the ibutaries, e LXX].
[illegible]		O	Value of ratio V — 100 (RS)$^{\frac{1}{2}}$.	
6	Silt.	σ	Silt-Density at mid-channel (in grains per cub. ft.), given for Belra Site only.	

CENTRAL SURFACE AND MEAN VELOCITIES.

TABLE LVIII.

Solání Left Aqueduct

Serial No.	1	2						3											4							5					
		Control.					Fall of Water-Surface	Rod Velocity Results											Central Surface Velocity Results							Surface-Slope Results.					
		Headworks Thanesuri		Tail Asafnagar								Wind.								Wind.							Wind					
		Gates open in Dam.	Gates closed in Regulator	Withdrawn by Distributaries.	Average Obstruction		Upper 5 miles.	Hyd. Mean Depth	Variation of water level	Surface-Breadth	Length of Rod	From		To		Time-keeper's Initial	Cubic Discharge in cub. feet per sec	Mean Velocity	Hyd Mean Depth.	Variation of water level	From		To		Central Surface Velocity (Mean of 43 trials)	Ratio $V \div v_0$	Hyd Mean Depth	Direction.	Velocity.	Surface-Slope (Left Bank)	Value of $100\sqrt{R}$	Ratio $V \div x$
	Date, 1877-78											Direction.	Velocity	Direction	Velocity					Direction.	Velocity.	Direction.	Velocity									
				Q	h		F_1	R		b	l						D	V	R						v_0	c	R			S	s	C
101.	14-12-78	0	0	0	266	·00	5 90	7 99	− ·03	82·0	9	NE	4	S	2	Cl	3 429	4·03									7 99	NE	4	183	3 82	1 055
	20-12-„	0	0	0	228	·00	5 87	92	− ·01	5	9	..	0	W	3	Cl	3,441	4 12									92	..	0	195	3 93	1·048
	19-12-„	0	0	0	228	00	5·93	91	− ·03	5	9	SE	2	NE	5	C	3,403	4·04									·93	SE	1	190	3 88	1 041
	2 Ranges,	0	0	0	38	·00	·08	14	·08	..	·5	0	..	..	..	..	..	32	09	No Observations.								07	..	..	012	11	·014
	v Means of 3	0	0	0	241	·00	5 92	5 49	7 94	..	82 2	0	SE & E 1			.	3,426	4 06									7 94	NE 1		189	3·88	1 048
103.	28-5-78	0	0	0	153	00	5 92	5 18	7 69	00	82 5	9	W	6	NW	7	R	3,107	3 86									7 69	W	6	205	3 97	972
	12-4-„	0	0	0	100	00	5·90	4 71	·65	+ ·12	5	9	SE & S	7	NE	8	R	3,107	3 88									62	SE & S	7	198	3 88	1·000
	27-5-„	0	0	0	123	·00	5·00	5 10	64	00	5 5	9	SW & W	8	SW	8	T	3 126	3 91									·64	SW & S	8	210	4 01	975
	15-4-79	0	0	0	115	00	5 83	5 22	62	+ ·03	5 5	8½	NW	2	SW	12	R	3,034	3 82									62	NW	2	215	4·05	·943
	4 Ranges,	0	0	0	53	·00	·16	51	·07	..	0	5	..	..	..	.	..	92	09	No Observations.								07	..	..	017	·17	057
	v Means of 4,	0	0	0	123	·00	5 91	5·05	7 65	..	82 5	8 0	SW & W 3			..	3,091	3 87									7 64	SSW 4		207	3 98	·973

105	6-4-78	0	0	0	146	00	5 93	4 74	7 23	—	00	84	0	8	NW	2	W	5	T	2 781	3 78	No Observations							7 23	NW	1	225	4 03	933
	20-3-„	0	0	0	0	·00	5 86	4 54	14	—	12		1	8	SW	1	..	0	R	2,629	3 61								18	SW	1	218	3 96	914
	δ Range	0	0	0	146	00	07	20	09	..		·1	0		..	..	..	.	.	152	·16								05	..	..	007	07	024
	ν Means of 2	0	0	0	73	00	5·90	4 64	7 19	..		84 1	8		W & N 2					2,705	3 70								7 21	NW	1	222	4 00	·926
106.	21-3-78	0	0	0	0	00	5 81	4·39	6 90		00	85·0	7½		SE	3	..	0	T	2 463	3 54	..	.	..	.	..	.	?	?	6 90	SE	3	220	3 90	908
	12-3-„	0	0	0	0	·00	5 85	4 20	77		00	·0	7½		SE	6	SE	2	T	2 377	3 50	.	..	..	.	..	.	?	?	77	SE	6	210	3 77	928
	6-3-77	0	2	0	113	00	5 92	4 28	75		·00	0	7½		..	0	..	0	W	2 328	3 4₀	6 75	00	..	0	N & E	7	4 05	847	75	..	0	188	3 56	963
	δ Range	0	2	0	113	·00	·11	19	15	..		·0	0		..	..	..	..		137	11	?	..	..	..	..	..	?	?	15	..	..	32	34	·055
	ν Means of 3,	0	⅔	0	57	00	5 86	4 29	6 81	..		85 0	7½		SE 2				.	2,300	3 49	?6 75	..	? N & E 4				?4 05	? 847	6 81	SE	3	206	3 74	933
107.	9-3-78	0	0	0	0	00	5 89	3 96	6 46	+	02	85 0	7		..	0	N	3	T	2,230	3 47	No Observations.							6 45	..	0	220	3 77	920
	8-3-„	0	0	0	0	·00	5 92	3 93	43	—	03	0	7		SW	9	NW	4	R	2 228	3 48								45	SW	9	223	3 79	918
	11-3-„	0	0	0	0	·00	5·94	3 91	·42		00	0	7		..	0	..	0	R	2,211	3 46								42	..	0	235	3 83	892
	7-3-„	0	0	0	0	00	5 90	3·90	41		00	0	7		S	6	..	0	T	2,183	3 42								41	S	6	223	3 78	·905
	δ Range,	0	0	0	0	00	05	06	·05	..		·0	0		..	..	..	..	..	47	·06								04	..	..	015	11	028
	ν Means of 4,	0	0	0	0	·00	5·91	3 93	6·43	..		85 0	7		SW & W 1				..	2,213	3 46								6 43	SSW	4	225	3 81	909

CENTRAL SURFACE AND MEAN VELOCITIES — TABLE LIX.

Solani Right Aqueduct

Serial No.	1. Date	2. Control: Headworks: Gates open in Dam	Gates open in Dam	Gates closed in Regulator	Withdrawn by Distributaries Q	Average Obstruction a	Fall of Water Surface, Upper 5 miles F₁	3. Rod-Velocity Results: Variation of water-level	Surface-Breadth b	Length of Rod l	Wind From: Direction	Velocity	Wind To: Direction	Velocity	Timekeeper's Initial	Cubic D discharge in cub feet per sec. D	Mean Velocity V
Series 108	31-5-7?	0	0	0	306	·00	5 8?	− 02	82 0	9½	..	0	NE	8	W	3,828	3 91
	5-6-76	0	0	0	290	? 00	5 80	00	0	9	..	0	S	6	W	3,840	3 93
	14-12-76	0	0	0	266	00	5 ?7	00	0	9	S	9	..	0	Cl	3 651	4 30
	17-6-76	0	2	0	302	? 00	5 87	00	·0	9	NE	6	NE	14	W	3,528	4 16
	14-6- "	0	0	0	303	? 00	5 83	+ 02	·0	9	NE	6	NE	8	H	3 424	4 04
	5-6-7?	0	0	0	98	00	5 82	·00	0	9½	SW	7	N	8	W	3,38?	3 99
	6-6 "	0	0	0	98	00	5 82	00	·0	9½	.	0	..	0	F	3,35?	3 96
	20-12-76	0	0	0	228	00	5 88	− 01	·5	9	W	4	SW	12	Cl	3,710	4 22
	1?-12 "	0	0	0	228	00	5 93	00	0	9	NE	5	NE	?	O	3 444	4 11
	17-?-76	0	0	0	206	? 00	5 83	− 03	·0	9	..	0	NE	7	W	3,313	3 95
	Range	0	2	0	205	? 00	17	.	5	5	..	..	.	..	.	338	39
	Mean …	0	½	0	233	? 00	5 86 ?		82 1	9 2	NE 1				.	3,429	4·00
109	20-7-76	0	0	0	318	·00	6·07	+ 05	82·5	9	..	0	SSW	8	R	3,577	4 3?

Serial No.	1. Date	4. Central Surface-Velocity Results: Hyd. Mean Depth H	Variation of water level	Wind From: Direction	Velocity	Wind To: Direction	Velocity	Central Surface Velocity (Mean of 15 trials) v_0	Ratio $V - v_0$ c	5. Surface-Slope Results: Hyd. Mean Depth H	Wind: Direction	Velocity	Surface-Slope (Right Bank) S	Value of $100\sqrt{HS}$ s	Ratio $V - s$ c
Series 108	31-5-7?	8 01	+ 01	.	0	.	0	4 55	85?	8·00	..	0	169	3 89	1·005
	5-6-76	7 ??	00	.	0	..	0	4 53	868	7 99	.	0	185	3 8?	1 021
	14-12-76		..	.	..	..	..	?	?	97	S	9	175	3 74	1 150
	17-6-76	7 97	00	V	10	NE	6	4 59	906	97	ENE	?	195	3 94	1 056
	14-6- "	96	00	L	8	NE	6	4 48	902	96	V	?	190	3 89	1 03?
	5-6-7?	97	00	..	0	SW	7	4 52	88?	97	..	0	191	3 90	1·023
	6-6 "	97	00	..	0	..	0	4 51	876	97	..	0	188	3 87	1·023
	20-12-76	.	..	..	.	..	.	?	?	92	SW	10	205	4 03	1 047
	1?-12 "		..	..	.	..	.	?	?	90	NE	?	200	3 98	1·033
	17-?-76	7 91	00	.	0	.	0	4 43	892	91	..	0	180	3 77	1 048
	Range	? 10	..	..	..	..	.	? 16	?,047	·10	..	..	030	29	145
	Mean …	?7 97	..	? ENL 1				?4 52	? 884	7·96	SW 2		190	3 89	1·045
109	20-7-76	No Observations								7 80	..	0	198	3 93	1 107

Series 109	3-5-77	0	0	0	62		4 9	7 80	00	82 5	9	NE	6	..	00	.	0	NE	12	4 43		.	0
	19 11-	0	0	0	306		5 28	79	00	·5	9	V	l	..	00	..	0	V	5	4 65		.	0
	11-5 76	0	0	0	238	?	5 43	79	− 05	5	9	..	0	..	00	..	0	..	0	4 44		.	0
	15 5- ,,	0	2	0	208	?	5 43	79	00	5	9	..	0	.	00	..	0	..	0	4 34		.	0
	12 5 ,,	0	3	0	208	?	5 40	77	00	5	9	NE	11	NE 1.	00	..	0	NE	11	4 39		.	0
	3 6- ,,	0	0	0	289	?	5·36	75	− ·12	5	9	..	0	NE 1	00	..	0	.	0	4 46		.	0
	2 6- ,,	0	0	0	289	?	5 32	72	− 04	5	9	E	5	NE	00	V	l	V	l	4 43			0
	12-4 78	0	0	0	100		4 81	·71	00	5	9	V	12	E 2	..	..	..	..	.	?			23
	16 5 76	0	0	0	208	?	5 3.	70	00	·5	9	..	0	NE 1	·00	NE	11	.	0	4 46			0
δ Range,		0	3	0	244	?	62	10	..	·0	0	..	..	..	..	..	.		..	? 41	?		..
υ Means of 9		0	?	0	212	?	5 26	7 76	..	82 5	9	NE δ E 5			..	? NE 2				? 4 44	?	.	3
110	8-8 78	0	0	0	333		4 94	7 63	− 03	82 5	8½	..	0	..	− 05	V	l	..	0	4 78			l
Series 110	28-5 78	0	0	0	153		5 12	7 6.	00	82 5	9	NW	l	V	..	..	..	..	.	?			l
	15 4 7.	0	0	0	115		5 27	6.	+ 05	·5	8½ 9	V	l	SW 1	..	..	..	..	..	?		V	12
	8-5 76	0	2	0	238	?	5 2.	64	00	5	9	.	0	NE 1	+ 03	..	0	..	0	4 23		.	0
	27 5 ,	0	0	0	123		5 08	63	00	5	9	S	8	SW 1	..	..	..	..	..	?		V	13
	8-6- ,	0	0	0	289	?	5 1.	63	− 22	5	9	NE	10	N	00	..	0	..	0	4 46			0
	1 6 ,	0	5	0	213	?	5 3?	62	− 05	·8	9	..	0	..	00	..	0	..	0	4 38		.	0
	3-5- ,,	0	2	0	213	?	5 2.	61	00	83 0	9	..	0	..	00	..	0	..	0	4 25		.	0
	2 5- ,,	0	5	0	213	?	5 2	61	00	·0	9	..	0	..	− 03	..	0	..	0	4 34			0
	28 4 ,,	0	2	0	233	?	5 27	59	00	1	9	..	0	..	00	..	0	..	0	4 33			0
	29 4 ,	0	4	0	213	?	5 2.	58	00	·1	9	..	0	..	00	..	0	..	0	4 40			0
δ Range		0	5	0	174	?	23	07	..	7	5	..	..	..	..	..	..	..	..	? 23	?		..
υ Means of 10,		0	2	0	200	?	5 22	7 62	..	82 8	9	SSW l			..	? Calm				? 4·34	?	V	3
110	20-4 77	0	0	0	0		5 10	7 58	00	83 1	9	..	0	N 1	+ 01	..	0		0	4 39			0
Series 111.	25-4 78	0	0	0	40		4 90	7 46	00	83 6	8½	N	7	..	..	..	..	..	..	?			10
	20-4 ,,	0	0	0	0		4 91	43	00	6	8½	..	0	..	..	..	..	..	..	?		.	0
	,, ,	..	,	,,	,		4·02	45	00	6	8½	..	0	..	00	..	0	..	0	4 29		.	0
	26-4- ,,	0	0	0	40		4 90	44	00	6	8½	N	9	V	00	SW	3	NW	9	4 34			11
	15-7 76	0	0	0	299	?	4 95	43	+ 01	·6	8	..	0	E 1	00	..	0	..	0	4 58		.	0
	13 11 77	0	0	0	305		4 40	42	− 02	7	8½	N	8	..	00	..	0	V	l	4 37			0
	23 5 76	0	0	0	181	?	4·9.	41	00	7	8	..	0	SW	+ 02	W	4	NE	6	4 37			0
	14 7- ,,	0	0	0	299	?	4 90	38	00	7	8	..	0	..	00	..	0	..	0	4 45			0
δ Range,		0	0	0	305	?	52	08	..	·1	5	..	..	..	..	..	..	..	..	? 29	?		..
υ Means of 8,		0	0	0	146	?	4 87	7 43	..	83 6	8 3	NL δ N 2			..	? NW 1				? 4 40	?	V	2

TABLE LIX.

CENTRAL SURFACE AND MEAN VELOCITIES.

Soláni Right Aqueduct

Serial No.	1	2						3														4							5					
		Control.				Fall of Water-Surface		Rod-Velocity Results.														Central Surface Velocity Results							Surface-Slope Results					
	Date, 1876—78	Headworks Thanau I.		Tail Auffanger				Hyd Mean Depth	Variation of water level	Surface Breadth	Length of Rod.	Wind				Timekeeper's Initial	Cubic D scharge in cub feet per sec.	Mean Velocity	Hyd Mean Depth	Variation of water level	Wind				Central Surface Velocity (Mean of 18 Rods)	Ratio V — v_0	Hyd Mean Depth	Wind		Surface-Slope (Right Bank)	Value of $100\sqrt{RS}$	Ratio V — v	
		Gates open in Dam.	Gates open in Dam	Gates closed in Regulator	Withdrawn by Distributaries.	Average Obstruction	Upper 5 miles.	Lower 4½ miles.					From		To							From		To									
												Direction.	Velocity.	Direction	Velocity							Direction	Velocity	Direction	Velocity								
		Q			z		F_1	F_2	R		s	l					D	V	R						v_0	c	R			S		c		
Series 103	31-5-76	0	0	0	306	00	5 89	5-66	8·00	− 02	82 0	9	..	0	NE	3	W	3,828	3 91	8 01	+ 01	..	0	..	0	4 55	859	8 00	..	0	189	3 89	1 005		
	5-6-76	0	0	0	290	? 00	5 80	5 70	7·99	00	0	9	..	0	S	5	W	3,840	3 93	7 99	00	..	0	..	0	4 53	868	7 99	..	0	185	3 8[illegible]	1 021		
	14-12-75	0	0	0	266	00	5 97	5-55	97	00	0	9	..	0	S	0	Cl	3 601	4 10	.	..	..	.	..	.	?	?	97	S	2	175	3 74	1 150		
	17-6-76	0	2	0	302	? 00	5 87	5 68	97	00	0	9	NE	6	NE	14	W	3,528	4 16	7 97	00	V	10	NE	6	4 59	906	97	ENE	2	195	3 94	1·056		
	14-6-76	0	0	0	302	? 00	5 87	5-6	97	+ 02	0	9	NE	6	NE	8	H	3 424	4 04	96	00	E	8	NE	6	4 48	902	96	V	2	190	3 89	1 030		
	5-6-76	0	0	0	93	00	5 82	5-58	97	00	0	9½	SW	7	N	8	W	3 385	3 99	97	00	..	0	SW	7	4 52	883	97	..	0	191	3 90	1·023		
	6-6-76	0	0	0	99	00	5 82	5-68	97	00	0	9½	..	0	N	0	P	3,355	3 96	97	00	..	0	..	0	4 51	878	97	..	0	188	3 87	1·023		
	20-12-75	0	0	0	228	00	5 88	5-42	91	− 01	0	9	W	4	SW	12	Cl	3 519	4 22	..	..	..	.	..	.	?	?	92	SW	13	205	4 03	1 047		
	19-12-75	0	0	0	228	00	5 93	5-4[illegible]	90	00	0	9	NE	5	NE	7	C	3 444	4 11	..	..	..	.	..	.	?	?	90	NE	2	200	3 98	1 033		
	17-5-76	0	0	0	208	? 00	5 83	?	90	− 03	0	9	..	0	NE	7	W	3,813	3 95	7 91	00	..	0	..	0	4 43	892	91	..	0	180	3 77	1 048		
	Means.	0	2	0	205	? 00	·17	? 28	10	..	5	5	..	..	..	..	..	338	39	? 10	..	..	..	..	.	? 16	? 047	·10	..	..	030	29	145		
									7·90	..	82 1	9·2			NE 1			3 429	4·00	?7 97	..	? ENE 1				?4 52	? 884	7 96	SW 2		190	3 89	1·045		
	Means of 10,	0	2	0	233	? 00	5 86	?·59																										
109	23-7-76	0	0	0	318	00	6·07	5 23	7 82	+ 03	82·6	9	..	0	S	8	E	3,577	4 39	No Observations								7 80	..	0	198	3 93	1 107		

Series 109	3 5-7·	0	0	0	62			4 9	7 80	00	82 5	9	NE 6	..	00	. 0	NE 1	.. 0	982
	19 11	0	0	0	306			5 28	79	00	5	9	V l	.	00	.. 0	V	.. 0	1 035
	11 5 76	0	0	0	238	?		5 43	79	− 05	5	9	.. 0	.	00	.. 0	..	.. 0	990
	15 5 ,,	0	2	0	208	?		5 43	79	00	5	9	. 0		00	.. 0	..	.. 0	1 016
	12 5 ,	0	3	0	208	?		5 40	77	00	5	9	NE 11	NE 1	00	.. 0	NE 1	.. 0	1 000
	3 6- ,	0	0	0	289	?		5 30	76	−·12	5	9	.. 0	NE 1	00	.. 0		.. 0	1 021
	2 6-	0	0	0	289	?		5 32	72	− 04	5	9	E 5	NE	00	V l	V	0	1 003
	12-4 78	0	0	0	100			4 81	71	00	5	9	V 12	E 2	..	.	.	E 23	1 031
	16 5 76	0	0	0	208	?		5 30	70	00	5	9	.. 0	NE 1	·00	NE 11	..	0	979
	δ Range,	0	3	0	244	?		62	10	..	0	0	.. ..	..	..	..	.	..	036
	ε Means of 9	0	⅓	0	212	?		5 26	7 76	..	82 5	9	NE b E 5		..	? NE 2		E 3	1 006
110	8 8 78	0	0	0	333			4 94	7 63	− 03	82 5	8½	.. 0	..	− 05	V l	..	V l	1 073
Series 110	28-5 78	0	0	0	153			5 12	7 65	00	82 5	9	NW l	V	..	.. .	..	V l	1 061
	15 4 75	0	0	0	115			5 27	65	+ 05	·5	8½ 9	V l	SW 1	..	.. ..	..	SW 12	1 010
	8 5 76	0	2	0	238	?		5 25	64	00	5	9	.. 0	NE 1	+ 03	.. 0	..	.. 0	970
	27 5 ,,	0	0	0	123			5 08	63	00	5	9	E 8	SW 1	..	.. ..	..	SW 13	1·029
	3-6-,	0	0	0	289	?		5 10	63	− 22	5	9	NE 10	N	00	.. 0	..	. 0	1 008
	1 5 ,,	0	5	0	213	?		5 33	62	− 05	8	9	.. 0	.	00	.. 0	..	.. 0	1 013
	3 5-,	0	2	0	213	?		5 25	61	00	83 0	9	.. 0	..	00	.. 0	..	.. 0	987
	2 5 ,,	0	5	0	213	?		5 2	61	00	·0	9	.. 0	..	− 03	.. 0	.	.. 0	984
	28 4 ,,	0	2	0	233	?		5 27	59	00	1	9	.. 0	..	00	.. 0	..	.. 0	987
	29 4 ,	0	4	0	213	?		5 25	58	00	·1	9	0	..	00	.. 0	..	.. 0	987
	δ Range	0	5	0	174	?		23	07	..	7	5	.. ..	..	..	.. ..	..	.. ..	·091
	ε Means of 10	0	2	0	200	?		5 23	7 62	..	82 8	9	SSW l		..	? Calm		SW 3	1 004
110	20 4 77	0	0	0	0			5 10	7 58	00	83 1	9	.. 0	N 1	+ 01	.. 0	..	.. 0	968
Series 111	23 4 78	0	0	0	40			4 90	7 46	00	83 6	8½	N 7	..	..	.. ..	..	N 10	974
	20-4-,,	0	0	0	0			4 91	45	00	6	8½	.. 0	..	..	.. ..	..	.. 0	1 013
	,, ,,	,,	,	,	,			4·92	45	00	6	8½	.. 0	.	00	.. 0	..	.. 0	1 011
	20 4-,,	0	0	0	40			4 90	44	00	6	8½	N 9	V	00	SW 3	NW	W 11	987
	15 7 76	0	0	0	299	?		4 98	43	+ 01	6	8	.. 0	E 1	00	.. 0	..	.. 0	1 068
	13 11-7·	0	0	0	315			4 40	42	− 02	·7	8½	N 8	..	00	.. 0	V	.. 0	1 085
	23 5 76	0	0	0	181	?		4·90	41	00	7	8	.. 0	SW	+ 02	W 4	NE	. 0	995
	14 7- ,,	0	0	0	299	?		4 00	38	00	7	8	.. 0	..	·00	.. 0	..	.. 0	1 034
	δ Range,	0	0	0	305	? 00	19	52	08	..	·1	5	.. ..	..	..	.. ..	..	.. ..	092
	ε Means of 8,	0	0	0	146	? 00	5·91	4 87	7 43	..	83 6	8 3	NE b N 2		..	? NW 1		NW 2	1 021

CENTRAL SURFACE AND MEAN VELOCITIES

SOLANO RIGHT AQUEDUCT

TABLE LX.

Serial No	1	2						3											4								5					
		CONTROL.				FALL of Water-Surface		ROD-VELOCITY RESULTS											CENTRAL SURFACE VELOCITY RESULTS.								SURFACE-SLOPE RESULTS.					
		Gates open in Dam	Gates open in Dam	Gates closed in Regulator	Withdrawn by Distributaries	Average Obstruction	Upper 8 miles	Lower 4½ miles	Hyd Mean Depth	Variation of water level	Surface-Breadth	Length of Rod	WIND From Direction	WIND From Velocity	WIND To Direction	WIND To Velocity	Timekeeper's Initial	Cubic Discharge in cub. feet per sec	Mean Velocity	Hyd Mean Depth	Variation of water level	WIND From Direction	WIND From Velocity	WIND To Direction	WIND To Velocity	Central Surface Velocity (Mean of 48 trials)	Ratio $V - v_0$	Hyd Mean Depth	WIND Direction	WIND Velocity	Surface Slope (Right Bank)	Value of $100\sqrt{RS}$	Ratio $V - v$
	DATE, 187[illegible]				Q	h	F_1	F_2	R		s	i						D	V	R							v_0	c	R			S	v	c
112	6-4 7[illegible]	0	0	0	146	00	5 93	4 74	7 23	00	84·0	8	W	3	NW	3	T	2 892	3 92	.	..	..	.	.	..	?	?	7 23	NW	3	193	3 74	1 048
	13 7 7[illegible]	0	0	0	298	? 00	5 90	4·60	11	00	1	8	.	0	NNE	8	H	2 713	3 75	7 11	00	.	0	.	0	4 43	847	11	..	0	220	3 96	947
	20-3-7[illegible]	0	0	0	0	00	6·00	4 41	·06	− 12	2	8	WSW	5	WSW	7	R	2 677	3 74	.	.	..		.	..	?	?	01	WSW	1	198	3 73	1 003
	δ Ranges	0	0	0	298	? 00	09	33	·17	..	2	0	..	..	..	..		215	18	?	..	.		..	..	?	?	22	..	..	027	23	101
	v Means of δ	0	0	0	148	? 00	5·94	4 58	7 13	..	84 1	8	NW 2					2 761	3 80	?7 11	.	? Calm				?4 43	?·847	7 12	NW	1	204	3 81	999
113	21 3-7[illegible]	0	0	0	0	·00	5·84	4 30	6 88	00	84 3	7½	..	0	V	1	T	2 663	3 8[illegible]									6 88	V	1	228	3 96	·972
	4 4 7[illegible]	0	6	0	67	? 00	5 80	4 30	77	00	4	7	.	0	SSW	6	W	2 447	3 63	6 77	00	..	0	..	0	3 97	907	77	..	0	205	3 73	965
114	6-3-7	0	2	0	113	00	5 9[illegible]	4 2[illegible]	7[illegible]	00	4	7½	N δ E	7		0	W	2 484	3 66	75	00	..	0	..	0	4 12	88	75	..	0	195	3 63	1 008
	12 3-7[illegible]	0	0	0	0	00	6 87	4 18	75	00	4	7½	..	0	SE	8	T	2 46[illegible]	3 63			..	.	..	..	?	?	75	SE	8	19[illegible]	3 63	1 000
	[illegible]-6-7[illegible]	0	0	0	261	? 00	5 8[illegible]	4 3[illegible]	73	− 06	4	7	..	0	S	5	W	2 544	3 76	6 75	00	..	0	..	0	4 28	879	7[illegible]	..	0	210	3 77	997
115	9 10-7[illegible]	0	0	0	172	00	6 10	4 10	63	00	4	7	..	0	..	0	G	2,561	3 86	63	00	..	0	.	0	4 37	883	63	..	0	198	3 62	1 066
	δ Ranges	0	6	0	261	? 00	30	26	25	..	1	5	..	..	..	..	.	222	16	? 14	..	..	..	..	.	? 40	? 028	25	..	.	033	·34	101
	v Means of δ	0	1	0	102	?·00	5 90	4 26	6 7[illegible]	..	84 4	7 3	SSE 1				..	2 528	3 73	6 73	..	? Calm.				?4 19	? 880	6 70	SE	1	205	3·72	1·001
116	9-3-7[illegible]	0	0	0	0	00	5·90	3·9[illegible]	6·45	00	84 5	7	V	2	..	0	T	2 349	3 66	..	..	..	.	..	.	?	?	6 45	..	0	203	3 62	1·011
	11-3 [illegible]	0	0	0	0	·00	5 9[illegible]	3 90	·41	00	·5	7	..	0	..	0	R	2,30[illegible]	3 62	.	..	..	..	..		?	?	41	.	0	20[illegible]	3 63	997
	8-3 [illegible]	0	0	0	0	·00	5 9	3·90	·41	00	·5	7	NW	6	NW	1	R	2 296	3 60	..	.	..	..	..		?	?	41	NW	1	20[illegible]	3 63	992
	7-3 [illegible]	0	0	0	0	·00	5 90	3·90	·41	00	·5	7	V	2	S	7	T	2 2[illegible]	3 [illegible]	.	..	..	.	.	.	?	?	41	S	7	213	3 70	9[illegible]
	8-11 7[illegible]	0	0	0	237	92	6·0[illegible]	2 90	·34	00	5	7	V	1	V	13	G	2,269	3 61	6 34	00	..	0	V	1	4·03	896	34	..	0	210	3 65	989
	δ Ranges	0	0	0	267	92	15	1 03	11	..	0	0	..	..	..	.		93	13	?	..	..	..	..	..	?	?	11	..	..	010	08	·037
	v Means of δ	0	0	0	57	·18	5 9[illegible]	3 71	6·40	..	84 5	7	SW δ W 1					2,29[illegible]	3·60	?6·34	.	? V 1				?4·03	? 896	6·40	S	1	207	3·63	989

117	5 11 77	0	0	0	?79	00	6-00	2 60	6 15		00	85 0	6½	E	4	N	6	G	2 172	3 60	6 17	05	N	3	E	4	4 00	900	6 19	N	3	209	3 60	1 000
	21 7 78	0	0	0	151	? 00	6 12	3 78	13	+	05	0	6		0		0	H	? 245	3 7?	11	00		0		0	4 04	9?	11		0	230	3 75	99?
δ Range.		0	0	0	128	? 00	12	1 18	02			·0	5						73	13	06						01	023	08			021	15	00?
v Means of 2.		0	0	0	215	? 00	6 06	3 19	6 14			85 0	6 3	NE ½ N ?					? 209	3 67	6 14		NE ½ E 1				4 02	91?	6 15	N ?		220	3 68	998
118	19 7 78	0	0	0	234	?	5 99	3 66	? 97	−	02	85 0	6		0	NNE	7	H	2 157	3 70	5 98	00		0		0	4 23	875	5 98		0	230	3 71	997
	12 1 78	0	0	0	22	47	5 93	3 07	83		00	0	6	E	7	N	8	P	2 044	3 6	83	00	V	l	S	4	3 91	9?3	83	V	l	215	3 54	1 020
	14 1	0	0	0	22	47	6-02	3 08	83		00	0	6		0		0	P	2 002	3 53	83	00		0		0	3-96	891	-83		0	2?4	3 6?	978
	20 7 78	0	0	0	200	?	6 0?	3 4?	81		00	0	6		0	N	9	W	2 0?9	3 59	81	00		0		0	4 3	869	81		0	?30	3 66	981
δ Range		0	0	0	212	? 00	12	49	16			0	0						155	17	17						32	054	1			015	17	042
v Means of 4		0	0	0	120	? 47	6 00	3 ?9	5 86			8? 0	6	NNE 3					? 058	3 61	5 86		S 1				4 06	890	5 8?	V	l	22?	3 63	994
Series 119	2? 7 78	0	0	0	0	?	6 40	3 10	5 5		00	85 0	6		0		0	H	1 908	3 56	5 ?5	00		0		0	4 2?	838	5 5?		0	240	3 65	975
	16 10-78	0	0	0	234	83	6 36	2 09	50	+	02	0	5½		0		0	P	1 974	3 72	51	00	V	l		0	4 28	869	49	•	0	180	3 14	1 185
	24 7 78	12	10	0	104	?	6 47	2 93	41	+	05	0	5	NE	10		0	W	1 977	3 79	47	+	10	0		0	4 22	898	51		0	270	3 86	982
	15 10-78	0	0	0	234	83	6 42	1 98	41	−	05	0	5½		0		0	R	1 963	3 77	39	−	02	0		0	4 18	902	43		0	188	3 20	1 178
	10 7	1	0	0	0	00	6 79	2 41	40	+	15	0	5	N	6	V	15	P	1 887	3 63							?	?	32	N	6	273	3 8?	9?3
	26 7 78	0	0	0	0	?	6-?0	2 80	32		00	0	5		0		0	H	1 864	3 65	5 32	00		0		0	4 ?1	88?	32		0	2?0	3 65	1·000
δ Range		12	10	0	234	? 83	49	1 12	23			0	5						113	23	? 23		•				? 17	? 0?4	23			093	72	232
v Means of 8.		½	1½	0	9?	? 5?	6 46	2 55	5 43			8?·0	5 4	NNE 1					1 929	3 69	?5 45		? V l				?4 21	?·875	5 44	N 1		234	3 5?	1·046
119	9 7 78	0	0	0	0	00	6 97	2 93	5 41	+	25	85·0	5½		0		0	R	2 107	4 04	No Observations								5·3?		0	313	4 08	990
121	14 10 78	0	0	0	234	1 08	6 17	1 5	5 02		00	8?·0	5		0		0	R	1 627	?·40	5 02	00		0		0	3 83	888	5 02		0	180	3 01	1 130
	27 7 78	0	0	0	0	?	6 3?	3 08	4 98	−	05	0	5		0	S	6	W	1 639	3 46	00	00		0		0	3 97	872	00		0	300	3 8?	894
δ Range		0	0	0	234	?	15	1 55	04			0	0						12	06	02						14	016	02			120	86	236
v Means of 2		0	0	0	117	?1·08	6 2?	2 31	5·00			8?·0	5	S 2					1 633	3 43	5 01		Calm				?·90	880	5·01	Calm		240	3 44	1·012

CENTRAL SURFACE AND MEAN VELOCITIES

TABLE LXI.

Solani Right Aqueduct

Serial No.	1 Date 18 6-7 78.	2 Controls: Headworks Dhanauri — Gate open in Dam	Gate open in Dam	Gate closed in Regulator	Tail Amlnagar — With drawn by Distributaries	Average Obstruction	Fall of Water-surface: Upper 5 miles	Lower 4½ miles	3 Rod-Velocity Results: Hyd Mean Depth	Variation of water level	Surface-Breadth	Length of Rod	Wind From: Direction	Velocity	Wind To: Direction	Velocity	Time keeper's Initial	Discharge in cub. feet per sec.	Mean Velocity	4 Central Surface Velocity Results: Hyd Mean Depth	Variation of water-level	Wind From: Direction	Velocity	Wind To: Direction	Velocity	Central Surface Velocity (Mean of 6 trials)	Ratio V — v_0	5 Surface-Slope Results: Hyd Mean Depth	Wind: Direction	Velocity	Surface-Slope (Right Bank)	Value of $100\sqrt{Rs}$	Ratio V — c
									D		b									D								D				s		
122	24 12 77	0	0	0	22	·67	5·60	1 75	4 07	+ ·04	85·0	4	S ¼ W	7	.	0	C	1 030	2 72									4·09	..	0	195	2 82	·960
	19 12 "	0	0	0	24	67	5 63	1 72	·03	00	·0	4	S	C	S ¼ W	7	P	1 031	2 74	4 05	00	..	0	S	6	3·07	893	05	V	2	203	2 87	·955
		0	0	0	24	67	5 65	1 70	03	00	0	4	SW	4	S	19	C	1 04	2 74	03	00	SW	6	SW	4	3·02	907	·03	..	0	218	2·96	·926
d Range.		0	0	0	2	00	03	·05	04		0	0	..	.	..			7	02	? 02		.	.	..	.	? 05	?·014	06	.	..	023	14	039
e Means of 3.		0	0	0	23	67	5 66	1 72	4 05	..	85·0	4	S ¼ W 7					1 025	2 73	?4·04		? SW ¼ S 4				?3·05	? 900	4 06	V ¼		205	2 88	949
122	23-8-78	0	0	10	0	00	6·37	2 20	4 05	+ ·05	85·0	4	N	7	E	8	P	1,219	3 24	4 03	+ ·03	E	8	S	10	3 72	871	4 10	..	0	243	3 16	1·025
	22 " "	15 10	0	173	? "	6·80	7 13	1 95	3 99	+ ·05	·0	3½	..	0	N	5	B	1 237	3 25	04	+ ·03	N	5	N	7	3 75	867	01	N	5	260	3 23	1 006
		15 10	0	173	? "	6·87	7 13	1 93	97	00	0	4	S	C	SE	4	H	1,214	3 30	3 97	+ ·03	..	0	.	0	3 79	871	3 95	..	0	330	3 61	914
d Range		15 10	10	173	?·00	82	? 30	08	..		0	5	..	..	.			23	06	12	.	.	..	.		07	004	06	..	..	087	45	111
e Means of 3.		5 3½	6½	58	? 00	6 43	?1 97	4·00			8·0	3·8	ENE 2					1,223	3·26	4·03	..	E ¼ N 1				3·75	870	4·02	N 2		278	3·33	982
124	31 7 78	8	0	8	0	?	6·61	1 29	3 26	− ·12	85·0	3	..	0	N	9	W	722 1	2 43	3 34	− ·08	..	0	..	0	2 90	836	3 42	..	0	190	2 58	942
125	16-" 78	2	0	10	0	·00	7 75	·4	1 93	− ·04	85·0	1½	S	½	S	½	P	276 9	1·61	1 98	− ·04	..	0	S	½	1·83	880	2·00	..	0	203	2·01	·801
127	11 7 78	16	0	10	0	50	7·40	?·00	69	·00	84 3	½	S	11	S	8	P	30 5	60	No Observations								·74	S	11	113	·91	·660

CENTRAL SURFACE AND MEAN VELOCITIES

Soláni Right Aqueduct—Left Aqueduct Closed

131	27 10 77	0	0	0	247	24 30	3·60	10	4 20	00	85·0	4	SW	5	NE	5	P	491 7	1 26	4 17	− 07	NE	5	NE	5	1 53	824	4 13	NE	5	026	1 04	1 212
	" "	"	"	"	"	"	"	"	20	·00	-0	4	"	0	SW	6	Q	472 2	1 21	·20	00				0	"	0	1 42	852	20	"	0	024	1 00	1 210
δ Range,	0	0	0	0	1 00	00	00	00	..		0	0	..	..	..	.	.	19 5	05	03	..	..	.	.	..	·11	·028	07	..	..	002	04	002
r Means of δ,	0	0	0	247	24 30	3 60	10	4 20	.		85 0	4			NE 2			482 0	·74	4 19	.			NE 6		1 48	883	4 17		NE 3	025	1·02	1 211
132	1 9 78	0	0	6	159	?	6 17	·08	3 67	− 04	85 0	3	..	0	..	0	H	1 648	4 87	3 69	00	..	0	..	0	5 79	841	3·69	..	0	480	4 21	1 157
	" "	"	"	"	"	"	"	"	63	− 05	0	3	..	0	..	0	W	1,597	4 78	66	− 01	..	0	..	0	5 68	·842	66	..	0	465	4 23	1 157
δ Range,	0	0	0	0	?	00	00	04	..		0	0	..	..	.			51	09	03	..	..	..	..	.	11	001	03	..	..	015	·08	·000
r Means of δ,	0	0	6	159	?	6 17	98	3 65	..		85 0	3			Calm.			1,623	4 83	3 68	..			Calm		5 74	842	3 68		Calm	478	4 17	1 157
135	21 9 78	0	0	8	71	1 33	6 22	·68	2 90	+ 05	85·0	2½	..	0	..	0	P	865 6	3 20	3·03	+ 03	..	0	..	0	3 60	889	3 04	..	0	253	2 77	1 155
136	21 9 78	0	0	8	71	1 33	6 28	62	2 94	+ 03	85·0	2½	..	0	..	0	H	740 2	2 79	2 95	+ 02	..	0		0	3 44	·811	2 92	..	0	208	2 46	1 134
137	31-8 76	0	0	8	78	?	6 47	43	2 94	+ 10	85 0	3	..	0	SW	12	H	667 8	2 51	2 69	+ 03	..	0	..	0	3 19	787	2 85	..	0	200	2 59	1 050
139	31-8 76	0	0	8	78	?	6 62	16	2 72	+ 05	85·0	2	..	0	..	0	W	620 7	2 54	2·68	+ 05	..	0	..	0	2·88	882	2 61	..	0	145	1 95	1 303
139	20-9 78	0	0	8	50	1 24	5 89	21	2 57	− 02	85·0	2	NW	1	V	1	R	525 6	2·28	2 50	00	V	1	S	1	2 67	854	2 59	NW	1	168	2·09	1·097
	" "	"	"	"	"	6·00	10	47	00		0	2	V	1	S	5	P	467 0	2 11	·47	00	S	5	SSW	6	2 42	·872	47	V	1	133	1·81	1 166
δ Range,	0	0	0	0	00	11	·11	10	..		·0	0	..	..	..	..	..	58 6	·17	09	..	..	.	..	.	25	018	12	..	..	035	28	069
r Means of δ,	0	0	8	50	1 24	5 93	16	2 52	..		85·0	2			S 1		..	496 3	2 20	2·52	..			S δ W 3		2 54	863	2 53		V 1	151	1 95	1 132

CENTRAL SURFACE AND MEAN VELOCITIES

TABLE LXII

Solani Embankment Main Site

Serial No.	Date, 1876-77 &c.	1	2 Control: Headworks (No. and Gates open in Dam)	2 Control: Headworks (Gates open in Dam)	2 Control: Headworks (Gates closed in Regulator)	2 Control: Tail Anafregor (Withdrawn by Intermittents) Q	2 Control: Tail Anafregor (Average Obstruction) h	2 Fall of Water-Surface: Upper 4 miles F_1	2 Fall of Water-Surface: 1 mile below Site F_2	2 Fall of Water-Surface: Lower 4½ miles F_3	3 Rod-Velocity Results: Hyd Mean Depth R	3 Rod-Velocity Results: Variation of water level	3 Rod-Velocity Results: Surface-Breadth s	3 Rod-Velocity Results: Wind From Direction	3 Rod-Velocity Results: Wind From Velocity	3 Rod-Velocity Results: Wind To Direction	3 Rod-Velocity Results: Wind To Velocity	3 Rod-Velocity Results: Timekeeper's Initial	3 Rod-Velocity Results: Cub. ft. Discharge in sub. feet per sec. D	3 Rod-Velocity Results: Mean Velocity V	4 Central Surface Velocity Results: Hyd Mean Depth R	4 Central Surface Velocity Results: Variation of water level	4 Central Surface Velocity Results: Wind From Direction	4 Central Surface Velocity Results: Wind From Velocity	4 Central Surface Velocity Results: Wind To Direction	4 Central Surface Velocity Results: Wind To Velocity	4 Central Surface Velocity Results: Central Surface Velocity (M as of 10 trials) v_0	4 Central Surface Velocity Results: Ratio $V - v_0$ c	5 Surface-Slope Results: Hyd Mean Depth R	5 Surface-Slope Results: Wind Direction	5 Surface-Slope Results: Wind Velocity	5 Surface-Slope Results: Surface Slope (Left Bank) s	5 Surface-Slope Results: Value of $100\sqrt{RS}$ v	5 Surface-Slope Results: Ratio $V - v$ C
151	14 12 76		0	0	0	266	00	4·74	1 18	5 60	9 37	− 03	171 0	E	7	..	0	A	7 364	4 09	9 30	− 03	S	7	.	0	4 61	887	9 39	E	0	230	4 65	880
	18-12		0	0	0	268	00	4 68	1·24	5 48	36	− 01	169 8	S	5	E	7	P	7,344	4 11	3	00	E	7	..	0	4 70	874	36	S	5	225	4 59	895
	19-12		0	0	0	268	00	4·70	1 23	5 42	34	− 01	·8	E b s	8	E	12	P	7,002	3 91	.				..	.	?	?	33	E	12	223	4 56	862
	20-12		0	0	0	268	00	4 72		5 40	33	+ 04	8	E	4	E b s	8	A	7 197	4 04					.	.	?	?	31	E	4	228	4 61	876
			0	0	0	268	00	4 69	1 25	5 40	30	− 01	8	S	3	W	10	A	6 940	3 91	.	.	.	.	..	..	?	?	30	S	3	228	4 61	848
d Range			0	0	0	2	00	09	10	20	07		1 2	.	.	.	.		424	20	?	.	.	.	.		? 09	? 013	09	..	.	007	09	047
e Means of 5			0	0	0	268	·00	4 70	1 2·	5 46	9 34	..	170 0	ESE 4					7,169	4·02	? 93·	..	? SE 3				?4 66	? 881	9 34	ESE 5		227	4 60	872
Series 152	18 12 76		0	1	0	285	? 00	4 83	1 12	5·60	9 23	00	171 0	E	17	E	18	P	6 927	3 93	9 23	+ 01	E b N	14	E	17	4 62	851	9 22	..	0	200	4 29	916
	20-12		0	1	0	195	? 00	4 83	1 1·	5 60	23	+ 01	·0	E	23	S	4	P	6 684	3 80	23	− 01	E	14	E	23	4 60	826	23	.	0	194	4 23	898
	22 12 76		0	0	0	123	00	4 70	1·2·	5 53	23	− 07	0	W	8		0	Q	6,590	3 72	26	00	.	0	.	0	4 31	851	26	..	0	213	4 44	838
	19-12		0	1	0	235	? 00	4 81	1·00	5 60	19	00	0	E	5	W	8	P	6 934	3 9	19	00		0	E	5	4 58	858	19	..	0	20·	4 34	906
	15-12		0	1	0	285	? 00	4 81	1 14	5 60	19	00	0		0	SW	17	W	6 8·1	3 88	19	00		0		0	4 51	860	19	..	0	203	4 32	898
	23-12		0	0	0	195	? 00	4 74	1 26	5 40	18	+ 03	169 8	SW	9	S	23	P	6 746	3 82	18	+ 02	SW	10	SW	9	4 55	840	23	.	0	198	4 28	893
	16-12		0	1	0	283	? 00	4 82	1·08	5·70	18	+ 02	171·0		0		0	P	6 ·92	3 88	17	+ 01	.	0	..	0	4 49	864	17	..	0	214	4 43	876
	14 12		0	1	0	284	? 00	4 81	1·00	5 60	17	+ 02	169·8	ENE	12	E b s	14	W	6 7·6	3 84	23	00		0	ENE	12	4 63	830	23	..	0	200	4 30	893
	22 12		0	0	0	130	? 00	4 70	1 19	5 4·	13	+ 03	8	SW	11	SW	2·	W	6 738	3·86	16	00	S	9	SW	11	4 34	890	16	..	0	207	4 3·	887
														..	0		0	P	6,389	3 6	11	00	..	0	..	0	4 46	·823	11		0	213	4 4·	832
d Range			0	1	0	162	? 00	13	18	30	10	.	1 2	.	.	..			545	26	15		..	.		.	29	067	13	. .		020	21	084
e Means of 10			0	1	0	22·6	? 00	4 79	1 15	·58	9·19	.	170 0	SSE 4					6,743	3 83	9 20	..	ESE 3				4 52	84·	9·20	Calm		20·	4 34	894

153.	15 4 78	0	0	0	115	00	4 60	1 22	5 23	9 00	+ 15	168 7	W	9	W	2	P	6 180	3 64	9 00	+ 04	W	6	W	15	4 32	843	8 92	W	9	265	4 86	749
	8 12 76	0	2	0	283	? 00	4 81	1 09	5 45	8 98	00	7		0	S	8	P	6 204	3 71	8 98	00		0	.	0	4 56	814	98	..	0	207	4 27	869
	28 5 78	0	0	0	123	·00	4 73	1 23	5 14	92	− 01	7	W	7	W	9	G	6 187	3 67	91	− 02	NNW	5	N	1	4 27	800	92	W	10	243	4 66	788
	12 4 „	0	0	0	100	00	4 76	1 21	4 73	90	00	7	E	8	E	8	G	6,162	3 6,	.	.	.		.		?	?	90	E	8	200	4 27	859
	27-5 „	0	0	0	123	00	4 68	1 24	5 08	88	− 01	7	V	1	V	9	P	6 231	3 72	8 88	− 03	WSW	16	SW	12	4 06	910	88	W	9	220	4 42	812
δ Range.		0	2	0	183	? 00	21	15	72	12	..	0						132	08	? 12	.	..	..	..	..	? 50	? 102	10	..	..	002	59	120
v Means of 5		0	½	0	149	? 00	4 72	1 20	5 13	8 94	..	168 7	W δ S 4					6,212	3 68	?8 94	..	? W δ S 6				?4 30	? 858	8 92	W	4	227	4 50	821
154.	7 12-78	0	0	0	206	00	4 70	1 30	4 85	8 77	+ 01	167 5	..	0	..	0	P	6,239	3 81	8 77	00	..	0	..	0	4 58	832	8 77	..	0	253	4 71	809
	10 4	0	0	0	115	00	4 62	1 28	4 90	66	+ 02	5	V	1		0	G	5,869	3 68	.	.	..	.		.	?	?	66	V	1	215	4 31	·854
	7-12 7,	0	0	0	297	00	4 72	1 30	4 78	·64	+ 01	166·3	S	9	W	7	G	5,814	3 63	8 64	00	S	4	S	9	4 35	834	64	..	0	220	4 36	·833
δ Range		0	0	0	182	00	10	02	12	13	..	1 2	.		..	.	..	425	18	? 13	..	..	..	..	.	? 23	? 002	13	..	..	038	40	045
v Means of 3		0	0	0	206	00	4 68	1 29	4 84	8 69	..	167 1	SW δ S 2					5,974	3 71	?8 71	..	? S 3				?4 47	? 833	8 69	V	1	229	4·40	·832
Series 155.	8-4 78	0	0	0	126	00	4 61	1 29	4 75	8 49	+ 05	166 3	V	1	W	6	P	5 460	3 48	8 48	+ 04	W	2	NW	2	4 25	819	8 52	W	6	215	4 28	813
	28 10 „	0	0	0	240	00	5 01	1 34	4 43	48	·00	3	..	0	..	0	R	6 353	4 05	48	00	..	0	.	0	4 68	860	48	E	7	248	4 59	882
	4 4- „	0	0	0	113	·00	4 63	1 27	4 75	47	+ 01	3	W	6	.	0	P	5 617	3 58	47	− 01	W	4	W	3	4 13	867	47	W	6	217	4 29	834
	6-4 „	0	0	0	146	00	4 68	1 2,	4 74	·43	00	3	W	6	W	6	G	5,379	3 45	43	00	V	1	V	1	4 12	837	43	W	6	215	4 26	810
	29-3- „	0	0	0	0	00	4 70	1 20	4 70	·41	− 02	3	W	20	W	19	P	5,365	3 45	43	00	W	19	W	23	3·86	894	42	W	20	205	4 16	829
	20 3 „	0	0	0	0	00	4 70	1 22	4 48	2,	− 21	·3	SW	1	WSW	1	G	5,212	3 42	..	..	..	..	..	..	?	?	34	SW	1	199	4 07	840
δ Range		0	0	0	240	00	40	14	30	·24	..	0	..	..	..	.	..	1,141	63	? 05	..	..	..	..	.	? 82	? 075	18	..	..	049	·52	072
v Means of 8		0	0	0	164	·00	4 72	1 26	4 65	8·42	..	166 3	W 5					5,564	3 57	?8 46	..	? W 5				?4 21	? 856	8 44	W	5	217	4 28	835
156	29-1-77	0	0	0	22	? 00	3·01	2 06	3 98	8 2,	− 02	165 2	..	0	E	7	W	4,930	3 26	8 25	+ 02	..	0	..	0	3 94	·827	8 25	..	0	223	4 29	·760
157.	21-3-78	0	0	0	0	00	4 59	1 23	4 38	8 11	00	164 0	SE	3	V	1	G	5 070	3 44	8 11	+ 20	..	0	..	0	4 15	829	8 11	SE	3	204	4 07	845
	3 3-77	0	1	0	22	00	4 65	1 2,	4 3,	02	00	0	S	4	..	0	W	4,750	3 26	02	+ 03	..	0	..	0	3 99	817	01	..	0	228	4 27	763
	6 3 „	0	2	0	113	00	4 65	1 28	4 27	7 98	+ 01	0	NW	10	..	0	W	4 594	3 18	7 98	− 01	.	0	N	1	3 99	797	7 98	..	0	215	4 14	768
	12-3 78	0	0	0	0	00	4 63	1 23	4 19	9,	00	0	SE	6	SE	8	P	4 826	3 35	95	·00	SE	2	..	0	3 94	·858	9,	SE	6	200	3 99	840
δ Range.		0	2	0	113	00	06	03	19	16	..	0	..	..	..	..	.	476	26	16	..	..	..	..	..	21	061	16	..	..	028	28	·082
v Means of 4		0	½	0	34	00	4 63	1 2,	4 30	8 02	..	164 0	SE δ S 1				.	4,810	3 31	8·02	..	SE 1				4·02	825	8 01	SE	2	212	4 12	804

CENTRAL SURFACE AND MEAN VELOCITIES.

TABLE LXIII.

Solani Embankment Main Site

Serial No.	Date, 1876	1	2 Control: Gates open in Dam	Gates open in Dam	Gates closed in Escalator	Headworks Pheasant: Withdrawn by Distributaries	Tail Assinaya: Average Obstruction	Fall of Water-Surface: Upper 4 miles	1 mile below Site	Lower 4½ miles	3 Rod-Velocity Results: Hyd. Mean Depth	Variation of water level	Surface Breadth	Wind From: Direction	Wind From: Velocity	Wind To: Direction	Wind To: Velocity	Timekeeper's Initial	Cubic Discharge in cub. feet per sec.	Mean Velocity	4 Central Surface Velocity Results: Hyd Mean Depth	Variation of water level	Wind From: Direction	Wind From: Velocity	Wind To: Direction	Wind To: Velocity	Central Surface Velocity (Mean of 18 trials)	Ratio V — v_o	5 Surface-Slope Results: Hyd Mean Depth	Wind: Direction	Wind: Velocity	Surface Slope, (Left Bank)	Value of 100 $\sqrt{RS}$	Ratio V — v.
			Q	h	F_1	F_2	F_3	R		s								D	V	R							C	R			S	w	C
158	13-9-76	0	0	0	197	?·00	4·73	1·17	4·3.	7·88	+ ·28	164·0	..	0	W	17	H	4,893	3·43	7·77	·00	.	0	..	0	4·30	798	7·77	..	0	215	4·09	839
	11 9- "	0	0	0	194	?·00	4·88	1·32	4·10	·80	− ·03	·0	..	0	E	4	H	4,828	3·42	·81	+ ·01	..	0	..	0	4·20	·814	·80	..	0	215	4·10	834
	Range	0	0	0	3	?·00	·15	·15	·25	·08	..	0	..	..	..	..	..	65	01	·04	..	..	..	..	..	·10	·016	·03	..	.	000	·01	005
	Means of 2	0	0	0	196	?·00	4·81	1·25	4·23	7·84	..	164·0		W 3			.	4,861	3·43	7·79	..		Calm				4·25	·806	7·79	Calm.		215	4·10	837
Series 159	9-9-76	0	0	0	207	?·00	4·8.	1·3.	3·9.	7·71	−·04	162·8	..	0	S	14	W	4·698	3·40	7·73	·00	..	0	..	0	4·17	·815	7·73	..	0	215	4·08	834
	9-9-76	0	0	0	0	·00	4·65	1·2.	3·9.	·67	− ·02	8	..	0	..	0	P	4,418	3·21	..	..	..	.	..	.	?	?	68	..	0	214	4·05	793
	8-9- "	0	0	0	0	·00	4·67	1·2.	3·93	·63	− ·01	·8	W	10	V	8	P	4·436	3·23	..	..	..	..	..	..	?	?	66	W	9	211	4·02	803
	7-9- "	0	0	0	0	·00	4·62	1·28	3·90	·6.	·00	8	S ⅛ W	6	W	7	G	4,373	3·19	.	..	..	..	..	..	?	?	65	S ⅛ W	6	213	4·04	790
	12-9-76	0	0	0	195	?·00	5·64	1·16	4·0.	·64	− ·03	8	..	0	NE	17	W	4,593	3·36	7·67	·00	..	0	..	0	4·16	806	67	..	0	210	4·01	838
	11-9-76	0	0	0	0	·00	4·68	1·26	3·91	·64	− ·01	·8	..	0	..	0	G	4·452	3·25	..	..	..	..	..	.	?	?	·6.	..	0	218	4·08	797
	8-9-76	1	0	0	219	?·00	4·92	1·23	3·9.	·62	·00	161·7	..	0	ENE	5	H	4·584	3·38	7·61	+ ·04	..	0	..	0	4·13	·816	59	..	0	220	4·09	827
	Range	1	0	0	219	?·00	1·02	·19	·15	·09	..	1·1	..	..	..	..	..	325	21	?·12	..	..	..	..	..	?·04	?·010	14	..	.	010	·08	·048
	Means of 7	0	0	0	89	?·00	4·86	1·2.	3·9.	7·6.	..	162·6		SSW 1				4·508	3·29	?7·67	..		? Calm.				?4·15	?·814	7·66	S W ⅛ W 2		243	4·05	812
Series 160.	25-5-76	0	0	0	62	·00	4·53	1·34	3·63	7·36	+ ·09	161·7	..	0	V	5	G	4,162	3·19	7·34	+ ·03	..	0	..	0	3·56	·896	7·32	..	0	218	3·99	799
	23 " "	0	0	0	0	·00	4·68	1·31	3·66	·28	+ ·06	7	W	6	W	15	P	4·153	3·22	..	..	..	..	..	.	?	?	31	W	15	208	3·90	826
	" " "	"	"	"	"	"	4·71	1·34	3·50	·26	− ·01	7	E ⅛ S	4	S	7	P	4,093	3·19	..	..	..	..	..	..	?	?	27	S ⅛ E	4	218	3·98	802
	6-5- "	0	0	0	22	·00	"	"	"	·26	− ·01	·7	S	7	W	6	G	4·086	3·18	..	..	..	..	..	..	?	?	26	W	6	213	3·93	809
	8-5- "	0	0	0	22	·00	4·71	1·27	3·47	21	·00	160·5	W	8	W ⅛ S	14	G	4·154	3·28	7·21	·00	W	8	W	8	3·71	884	20	W ⅛ S	14	210	3·89	843
	" " "	0	0	0	22	·00	4·65	1·29	3·41	18	− ·02	·5	N	7	N	4	G	4,072	3·23	..	..	..	..	..	..	?	?	18	N	7	214	3·92	·824
	Range	0	0	0	62	·00	·18	·07	·22	·18	..	1·2	..	..	..	.		90	10	?·13	.	..	..	..	.	?·15	?·12	·14	..	..	010	·10	·044
	Means of 4	0	0	0	18	·00	4·67	1·32	3·61	7·26	..	161·3		W ⅛ S 4				4,120	3·22	?7·28	..		? W 4				?3·64	?·890	7·26	W G		214	3·94	817

161	19 2 76	0	0	0	0	·00	4 64	1 31	3·40	7 15	−	01	159 3	S	4	·	0	P	3 958	3 18								?	?	7 15		0	219	3 96	803
	,,	,,	,,	,,	,,	,,	,,	,,	,,	15	+	01	3		0	S	4	G	3 909	3 14	7 14	+	01	·	0		0	3 69	851	14		0	217	3 94	797
	18 2 ,,	0	0	0	22	00	4 65	1 30	3 40	14		00	3	E b S	10	E b S	4	P	3 811	3 06		··		·				?	?	14	E b S	12	215	3 92	781
	20-2	0	0	0	0	00	4 63	1·32	3 40	1	−	02	3	S	9	WNW	8	G	3 834	3·07	·			··	·	·	·	?	?	15	WNW	8	213	3 90	787
	14 2- ,,	0	0	0	22	00	4 68	1 27	2 90	·03		00	3	S	8	S	18	P	3 803	3 11		··		··	·	·	·	?	?	03	S	11	219	3 92	793
δ Range,		0	0	0	22	00	05	05	50	12	·		0						155	12	?			··	·	·	·	?	?	12	·	·	006	06	022
v Means of 5,		0	0	0	9	00	4 65	1·30	3·30	7 12			159 3	S b E 4					3 863	3 11	?7 14			? Calm.				?3 69	? 851	7 12	SSE	2	217	3 93	792
162	9 11 76	0	0	0	0	? 00	5·01	1 14	3 25	6·90	+	02	159 3		0	··	0	W	4 015	3 36	6 90	−	03	·	0		0	3 94	853	6 91	··	0	275	4 36	771
	2 2 76	0	0	0	22	·00	4 94	1 26	2 93	87	−	01	3	S	9	S	9	G	3 750	3 15	88	−	01	V	I	S	9	3 54	890	87	S	9	217	3 86	816
	8 11 76	0	0	0	0	? 00	5 01	1·09	3 25	77	−	02	3	·	0		0	P	4 092	3 49	77		00	··	0	··	0	3 91	893	77	··	0	285	4 39	795
	24 10 ,,	0	0	0	19	? 00	5 2·	1 10	3 15	70	−	01	3		0	ENE	7	P	3 944	3 41	70		00		0	·	0	4 26	800	70	··	0	170	3 38	1·009
	,, ,,	,,		,,	,,		5 27	,,	3 13	·68	−	02	3	ENE	7	NE	4	W	4,062	3 52	73	+	01	·	0	·	0	4 40	800	72	··	0	160	3 28	1 078
δ Range		0	0	0	22	? 00	33	17	30	22	·		0	·		·			342	37	20	·		··		·	·	86	093	21	··	·	125	1 11	302
v Means of 5,		0	0	0	12	?·00	5 10	1 14	3 15	6 78			159 3	SE b E 2					3 973	3 39	6 80			S 1				4 01	847	6 79	S	2	221	3·8·	893
163	21 10 76	0	0	0	0	?	5·07	1 23	2 70	6 25	−	01	157 0		0	·	0	H	3,342	3 15	6 25		00	··	0	·	0	3 58	880	6 25	··	0	155	3 11	1·013
	,, ,,	,,	,,	,,	,,	?	5 11	,,	2 66	22	−	02	·0		0	S	6	W	3 286	3 12	24	−	02	··	0	··	0	3 51	889	24	··	0	150	3·06	1·020
	19-10-	0	0	0	0	?	5·17	1 23	2 60	17	+	01	·0	W	12	SW	4	W	3 127	2 99	16		00	··	0	NbE	5	3 59	833	16	··	0	195	3 47	862
	,,					?	5 13	,,	2 59	16		00	0	W	7	··	0	H	3 189	3 06	16		00	·	0	·	0	3 60	850	16	··	0	200	3 51	872
	20-10-,,	0	0	0	0	?	5·08	1 22	2·60	16	−	01	·0		0	·	0	H	3 166	3·04	16	+	01	·	0	·	0	3 67	828	16	··	0	165	3 19	953
	,, ,,	,,	,,	,,	,,	?	5 12	,,	2 56	13	−	01	·0	·	0	··	0	W	3 0·5	2 95	14	−	02	·	0	·	0	3 63	813	15	··	0	160	3 14	939
δ Range		0	0	0	0	?	10	01	14	12	··		0	·		··	·		287	20	11	··		··	·	··	·	·16	076	10	·		050	45	158
v Means of 5,		0	0	0	0	?	5·11	1 23	2 62	6 18	·		157 0	WSW 2					3 194	3 05	6 19	··		N b E 1				3 60	849	6 19	Calm		171	3·25	943
	10-10-76	0	0	0	214	?	4·88	97	1 30	5 78	+	03	154 7	NW	6	·	0	P	2 485	2 60	5·78	−	01	··	0	·	0	3 02	861	5 78	··	0	170	3 14	828
	,, ,,	,,	,,	,,	,,	?	4 91	94	,,	75	+	02	7	·	0	NW	6	W	2 492	2 62	74		00	·	0	··	0	2 97	882	74	··	0	180	3 21	816
	1 10- ,,	0	0	0	214	?	4·63	77	1 2	·69	−	·03	7	··	0	E	14	P	2 278	2 42	69		00	··	0	··	0	2 80	864	69	··	0	140	2 82	858
	,, ,, ,, ,,					?	4·67	73	,,	65		00	7	·	0	·	0	W	2 228	2 38	65		00	··	0	·	0	2 87	829	65	··	0	155	3 00	793
		0	0	0	0	?	28	24	10	13	·		0	·	·	··	·		254	24	13	··		·	··	·	·	22	053	·13	··	·	040	39	065
		0	0	0	214	?	4 77	·85	1 25	5 72	·		154 7	NE b N 1					2,371	2 51	5 72	··		Calm				2 92	859	5 72	Calm.		161	3 04	824

CENTRAL SURFACE AND MEAN VELOCITIES

TABLE LXIV.

Solani Embankment Main Site.

Serial No.	1	2							3										4									5					
		Control					Fall of Water Surface					Rod-Velocity Results										Central Surface Velocity Results												
		Headworks Dhanauri		Tail Asafnagar									Wind									Wind.												
													From		To							From		To									
	Date 1876-77 78	Gates open in Dam	Ogees open in Dam	Gates closed in Regulator	Withdrawn by Distributaries.	Average Obstruction	Upper 4 miles.	1 mile below Site	Lower 4½ miles	Hyd Mean Depth	Variation of water level	Surface-Breadth	Direction	Velocity	Direction	Velocity	Timekeeper's Initial	Cubic Discharge in cub feet per sec	Mean Velocity	Hyd. Mean Depth	Variation of water level	Direction	Velocity	Direction	Velocity	Central Surface Velocity [Mean of 48 trials]	Ratio $V - v_0$							
		Gates open in Dam	Ogees open in Dam	Gates closed in Regulator	Withdrawn by Distributaries.	Average Obstruction	Upper 4 miles.	1 mile below Site	Lower 4½ miles	Hyd Mean Depth	Variation of water level	Surface-Breadth	From Direction	From Velocity	To Direction	To Velocity	Timekeeper's Initial	Cubic Discharge in cub feet per sec	Mean Velocity	Hyd. Mean Depth	Variation of water level	From Direction	From Velocity	To Direction	To Velocity	Central Surface Velocity [Mean of 48 trials]	Ratio $V - v_0$	Hyd Mean Depth	Wind. Direction	Wind. Velocity	Surface Slope [Left Bank	Value of $100\sqrt{RS}$	Ratio $V - v_0$
		Q	k				F_1	F_2	F_3	R		b						D	V	R						v_0	c	R			s	$\sqrt{RS}$	C
166	9-10 76	0	0	0	172	?	4 87	88	1 35	5 39	− 02	152 3	..	0	E	12	P	2,100	2 40	5 40	− 01	..	0	..	0	2 81	854	5 40	..	0	155	2 89	·830
167	7 10 76	0	0	0	137	?	4 65	75	1 30	5 05	− 02	152 3	..	0	NE	5	P	1 686	2 06	5 06	00	..	0	..	0	2 36	873	5 06	..	0	205	3 22	640
	14 2 77	0	0	0	16	·50	4 70	1 05	1 70	00	·00	151 2	..	0	S	10	W	1,759	2 20	00	·00	..	0	..	0	2 36	932	00	..	0	185	3 04	·712
	δ Range	0	0	0	121	?	05	30	40	05	.	1 1	..	..	..	..	.	73	14	06	..	..	..	..	..	00	059	06	..	.	020	·18	072
	v Means of 2	0	0	0	77	? 50	4 68	90	1 50	5·03	..	151 8	SE δ S 2				.	1,723	2 13	5 03	..	Calm				2 36	903	5 03	Calm		195	3 13	676
169	6-10 76	0	0	0	59	?	4 67	93	1 00	4 84	00	150 0	..	0	..	0	P	1,469	1 91	4 84	00	..	0	..	0	2 00	955	4 84	..	0	200	3 11	·614
	5 10 „	0	0	0	60	?	4 71	1 49	0 40	81	− 01	0	..	0	..	0	W	1,420	1 86	81	+·01	..	0	..	0	2 06	903	82	..	0	200	3 11	599
	δ Range	0	0	0	1	?	04	56	60	03	..	0	..	..	..	..		49	05	03	..	..	..	..	..	06	·052	02	..	..	000	·00	015
	v Means of 2	0	0	0	60	?	4 69	1 21	·70	4 83	..	150 0	Calm.					1,445	1 89	4 83	..	Calm				2 03	929	4 83	Calm		200	3 11	607
170	25 9-76	0	0	0	136	?	4 40	70	·60	4 72	− 06	150 0	..	0	..	0	H	1,152	1 54	4 75	+ 01	V	l	..	0	1·82	846	4 76	..	0	165	2 80	·550
171	31-10-77	0	0	0	263	? 30	3 66	24	10	4 76	+ 01	150 0	S	4	S	17	G	704 3	·93	4 76	+ 01	SE	5	S	4	·92	1 011	4 76	SE	5	038	1·35	689

173.	2 10 7	0	0	8	232	2 08	4 34	41	10	3 88	− 01	150 0	.	0	E	11	h	85° 7	1 40			.	.	.	?	?	3-89	.	0	093	1 90	737
	8-10 „	0	0	8	232	2 08	4 24	41	10	88	-00	0		0	SW	17	h	828 7	1 36	3 88	00		0		0	1 53	88	88	.	0	090	1 87	727
	4-10 „	0	0	8	232	2 08	4 31	39	10	86	− 02	0	E	6	E	9	P	794 4	1 3	87	00		0	E	6	1 51	84	87	.	0	088	1 85	708
	4 10 „	0	0	8	232	2 08	4 34	41	0	84	00	0	E	8	E	1°	P	820 7	1 36	85	− 01		0	E	8	1 54	883	85	..	0	083	1 79	760
	7-10 „	0	0	8	232	2 08	4 24	41	10	84	− 02	0	.	0	N	8	P	806 1	1 34	85	00	..	0		0	1 52	882	85	..	0	085	1 81	740
	δ Range	0	0	0	0	00	10	02	05	04		0	.		.			58 3	09	? 03		..	.	..	.	? 04	? 049	04		.	010	11	052
	ν Means of 5	0	0	8	232	2 08	4 29	41	09	3 86	.	150 0	E & S 3				.	820 5	1 35	?3 86				? E 2		?1 54	? 874	3 87	Calm		088	1 84	734
174	26-9 76	0	0	0	106	?	4 59	51	·60	4 20	− 27	100 0	..	0	..	0	W	887 6	1 34	4 33	+ 02	..	0		0	1 52	882	4 34	..	0	120	2 33	575
175	4 10 76	0	0	0	0	?	5 06	1 14	1 40	4 05	+ 05	1,00 0		0	..	0	H	1,15 0	1 82	4 03	00	..	0	.	0	1 86	978	4-03	..	0	215	2 94	618
176	26 9 76	3	0	8	109	2 09	5 00	70	30	3 28	00	150-0	E	8	E	18	P	842 7	1 6			..		.	.	?	?	3 28	E	8	?323	?3 26	? 506
	24 9 „	6	0	8	99	1 43	5 06	69	30	27	00	·0	.	0	NW	5	R	837 1	1 6	3 26	00	NW	5	..	0	1 79	·022	27	..	0	160	2 29	721
	δ Range,	3	0	0	10	06	06	01	·00	01	.	·0	..	.	..	..	.	5 6	00	?	.	..	..	.	.	?	?	01	..	..	?163	? 03	? 215
	ν Means of 2	4½	0	8	104	1 76	5 03	·70	30	3 28	..	150 0	E & N 6				..	839 9	1 6	3 26	..			? NW 3		?1 79	? 022	3 28	E 4		?242	?2 78	? 613
177	27 9 76	0	0	0	0	?	4 94	1·01	1 3	3 70	−·04	150 0	..	0	E	10	H	866 5	1 50	3 72	+ 01	..	0	..	0	1 61	932	3 73	..	0	200	2 73	649
	29 9 „	0	0	0	0	?	5 03	1 17	1 03	61	+ 10	0	NE	4	NE	4	H	851 3	1 51	57	00	E	1	NE	4	1 54	981	57	E	1	190	2 64	572
	28 9 „	0	0	0	0	?	5 05	1·00	1 13	55	− 03	0	E	12	E	27	W	788 8	1 42	·57	00	..	0	..	0	1 50	947	·57	..	0	180	2 57	503
	δ Range,	0	0	0	0	?	11	17	32	15	.	0	..	.	..	.		77 7	09	15	.	..	.	..	..	·11	049	·16	..	.	015	16	023
	ν Means of 3	0	0	0	0	?	5 01	1 00	1 17	3 62	..	150 0	E & N 9					835 5	1 48	3 62	..			NE 1		1 50	953	3-62	E 1		193	2 60	508
179	3 10 76	0	0	0	0	?	5 18	1 0	90	3 11	00	100 0	..	0	..	0	H	583-7	1 21	3 11	00	..	0	..	0	1 26	961	3 11	..	0	180	2 37	511
180	19 9 76	0	0	0	17	1 24	5 54	56	10	2 28	+ 08	100 0	..	0	..	0	P	315 0	90	2 24	− 01	..	0	.	0	98	918	2 25	..	0	150	1 84	489
	18 9 „	0	0	9	21	1 24	5 60	-1	10	24	00	0	NW	1	..	0	R	286 7	84	24	00	..	0	E	1	83	1 012	24	NW	1	145	1 80	467
	δ Range,	0	0	0	4	00	35	35	00	04	..	0	..	..	..	.	.	28 3	06	00	.	..		..	..	15	094	01	..	.	005	04	022
	ν Means of 2	0	0	9	19	1 24	5 72	30	10	2 26	..	150 0	NW 1				.	300 9	87	2 24	..			E 1		91	960	2 25	NW	1	148	1 82	478
		12 7 76	13	0	10	0	67	7 08	59	?06	1 69	+ 07	150-0	.	0	S	11	R	114 1	44	No Observations							1 73	S	11	090	1 25	302

CENTRAL SURFACE AND MEAN VELOCITIES

Fifteenth Mile Old Site

Serial No.	1 Date 18 8.	2 Control: Gates open in Dam	Gates open in Dam	Gates closed in Race-ways	Tail-race: Water withdrawn by Distributaries. Q	Tail-race: Average Obstruction k	Fall of Water-Surface: Upper 2 miles. F_1	2 miles below S. F_2	Lower 4½ miles	3 Rod Velocity Results: Hyd. Mean Depth	Variation of water level	Surface Reading b	Wind From: Direction	Wind From: Velocity	Wind To: Direction	Wind To: Velocity	Tendency	Change in Reading per sec.	Mean Velocity	4 Central Surface Velocity Results: Mean Depth	Variation of water level	Wind From: Direction	Wind From: Velocity	Wind To: Direction	Wind To: Velocity	Central Surface Velocity. Mean of all trials.	$V - v_0$	5 Surface Slope Results: Mean Depth	Wind: Direction	Wind: Velocity	Surface Slope (Left Bank) s	Value of $100\sqrt{RS}$	Ratio $\frac{V}{C} = \frac{v}{C}$
191	29 Oct 78	0	0	0	123	00	2 98	3			02	174 9	NW	1	N1	3	T	7			00	NW	1	NW	1	4 91			NW	1	240	4 77	87°
192	24-4 78	0	0	0	0	00	2 94	3			01	174 9	N	3		0	T	5			00	N	3	N	1	4 66			N	3	238	4 54	839
	23-4	0	0	0	0	00	2 9	3			01	9		0		0	R	6			00		0		0	4 58				0	228	4 44	937
	10 4	0	0	0	115	00	2 96	3			01	9		0		0	T	6			00		0		0	4 71				0	253	4 67	857
	29 4 "	0	0	0	50	00	2 26	3			02	9		0		0	R	6			00		0		0	4 57				0	223	4 39	911
	30 4	0	0	0	50	00	2 29	3			+ 02	9		0		0	T	6			00		0		0	4 54				0	220	4 35	910
	1-5-	0	0	0	50	00	2 26	3			01	9		0		0	R	6			00	N	3		0	4 6				0	225	4 40	911
	δ Range.	0	0	0	115	00	05					0														17					033	32	107
	v Means of 6.	0	0	0	44	00	2 26	3				174 9		N1				6					N 1			4 60			N1		231	4 47	893
193	8 4 78	0	0	0	126	00	2 26	3			+ 12	174 9		0		0	R	5			+ 03		0		0	4 57				0	228	4 37	890
	4 4	0	0	0	113	00	2 31	3			00	9		0		0	T	5			00		0		0	4 44				0	223	4 33	891
	29-3	0	0	0	0	00	2 34	3			00	9	N	8	NW	7	R				00	S	9	V	b	4 53			N	8	230	4 38	8 9
	δ Range	0	0	0	126	00	08					0														13					007	05	012
	v Means 3.	0	0	0	80	00	2 30	3				174 9		NNW 2									S 2			4 51			N 3		227	4 36	887
194	15 4 78	0	0	0	0	00	2 27	3			− 03	174 9	SW	4		0	R				01		0		0	4 55			SW	4	228	4 31	912
	16 4	0	0	0	0	00	2 26	3			+ 01	9		0		0	T				00		0		0	4 66				0	233	4 30	912
	δ Range	0	0	0	0	00	01					0														11					005	01	000
	v Means 2	0	0	0	0	00	2 27					174 9		SW 1									Calm			4 61			SW 2		231	4 31	912
195	25 5 78	0	0	0	62	00	2 00				+ 15	171 3		0		N	l	T			00		0		0	4 23			5 Observations				

Fifteenth Mile New Site

[The Surface-Slope (S) is the mean of measurements on both banks (given in Table XLIX.), the state of the Wind is given for each]

Serial No.	1	2								3										4							5					
		Control					Fall of Water Surface			Rod Velocity Results										Central Surface Velocity Results													
		Headworks (Hanau)		Tail (Aschaffenburg)									Wind								Wind							Surface Slope Results					
	Date 1878-79	Gates open in Dam	Ogees open in Dam	Gates closed in Regulator	Withdrawn by Distributaries	Average Obstruction	Upper 2 miles	3 miles below Site	Lower 4½ miles	Hyd Mean Depth	Variation of water level	Surface-Breadth	From		To		Timekeeper's Initial	Cubic Discharge in cub. feet per sec.	Mean Velocity	Hyd Mean Depth	Variation of water level	From		To		Central Surface Velocity [Mean of 4 trials	Ratio $V - v_0$	Hyd Mean Depth	Wind		Surface-Slope [Both Banks]	Value of $100\sqrt{RS}$	Ratio $V - w$
													Direction	Velocity	Direction	Velocity						Direction	Velocity	Direction	Velocity				Direction	Velocity			
		Q	k	F_1	F_2	F_3	R		s								D	V	R						v_0	c	R			S	c	C
196.	18 12 78	0	0	0	268	00	2 28	3 69	5 43	8 71	− 03	186 0	W	3	.	0	R	6 921	4 14	8 68	00	NW	4	..	0	4 69	883	8 72	W 3 .. 0		?215	?4 33	? 956
	19 12- „	0	0	0	268	00	2 21	3 64	5 45	68	+ 01	185 9	..	0	\	l	S	6,844	4 11	68	00	V	l	..	0	4 61	892	68	.. 0 V l		226	4 45	·928
	20-12 „	0	0	0	268	00	2 28	3·62	5 23	·63	·00	7	..	0	V	l	R	6,800	4 12	64	− 01	S	9	W	6	4 77	864	63	. 0 V l		222	4 38	941
	3 Means,	0	0	0	0	00	·07	·07	·22	08	..	3	..	.	..	.		115	03	04	..	..	.	..	..	16	·028	09	.. ..		?011	? 10	? 028
	(3 means of 8,	0	0	0	268	00	2 26	3·65	5 31	8 67	..	185 9	W 1					6 857	4 12	8 67	..	SW 1				4 69	880	8 68	W 1		?221	?4 38	? 942
197	15 4 79	0	0	?	113	00	2 19	3·66	5 20	8 35	+ 10	184 2	V	l	SW	14	S	6,287	3 98	8 37	+ 02	V	l	SW	13	4 52	881	8 35	V l SW 14		220	4 29	928

CENTRAL SURFACE AND MEAN VELOCITIES

TABLE LXVI.

Brera Site.

[The surface-S eries (2 is the mean of measurements on both banks (given in Ta les L LI) the state of the Wind is given for each]

Serial No.	Date, 1879	2 Control: Tail of Reach: Widthwise by Distributaries Q	2 Control: Tail of Reach: Average Obstruction h	2 Tail of Water: Upper 1 mile. F_1	2 Tail of Water: Lower 4 miles. F_2	3 Rod Velocity Results: Hyd Mean Depth R	3 Variation of water-level	3 Surface-Breadth b	3 Wind: From: Direction.	3 Wind: From: Velocity.	3 Wind: To: Direction.	3 Wind: To: Velocity.
201.	27 3	27	00	72	4·0	9 13	− 07	188	..	0		0
	9·1	243	00	?	?	·0	00					
	11 1	257	00	?	?	8 38	+ 03	4	S	8	.	0
	10·1	257	00	?	?	38	− 02	4	S	6	.	0
	17·3	62	00	67	2·00	03	− 02	3				
? Range		230	00	? 05	? 1.	26	..	2	..	..	.	..
? Means of 5		169	·00	? 70	?3·08	9·02	..	188 4	S 1			
Series 202	21 1	209	00	?	?	8 7.	·00	188·0	..	0	.	0
	22 1	221	00	?	?	74	+ 02	0	N	3	Nw	4
	·3 1	221	00	?	?	·68	00	187 5	..	0	..	0
	,	,,	,,	?	?	71	00	188 0	NW	11	NW	5
	18·3	143	00	6·	3 81	8·	00	2	..	0		0
	24 2	0	00	38	3 ..	68	− 05	0		0	S	4
	17 1	298	00	?	?	63	+ 03	0	N	7	NW	3
? Range		298	00	? 32	?·22	23	..	3	..	.	..	.
? Means of 7		168	·00	? 82	?3·70	8 72	..	188·0	NNW 2			

Serial No.	Date, 1879	4 Central Surface-Velocity Results: Hyd Mean Depth h	Variation of water-level	Wind: From: Direction	Wind: From: Velocity	Wind: To: Direction	Wind: To: Velocity	Central Surface Velocity (mean of 4 trials) v_0	Ratio $V = v_0$ c	5 Surface-Slope Results: Hyd Mean Depth R	Wind: 1st Slope: Direction	Wind: 1st Slope: Velocity	Wind: 2nd Slope: Direction	Wind: 2nd Slope: Velocity	Surface-Slope (Back Bank) S	Value of $100\sqrt{f}$	Ratio $V = u$ C	6 Silt in grains per cub. ft. q
	27 3	18	− 03	..	0	..	0	3 59	830	9 19	..	0	..	0	180	4 07	·737	86
	9·1	.	.	.	..	..	.	?	?	03	..	0	..	0	200	4 25	·76·	71
	11 1	00	+ 01	S	1	..	0	3 68	88·	8·08	S	8	.	0	203	4 27	·766	93
	10·1	07	00	S	5	..	0	3 73	874	·08	S	6	..	0	1·3	4 16	·781	(
	17·3	04	00	N	1	N	1	3 6·	83·	·3	N	1	N	1	178	3 99	·767	1025
? Range		24	..	..	..	..	..	? 14	? 053	26	..	.	..	.	025	28	047	?954
? Means of 5		·02	..	?S 1				?3 67	? 85·	9 02	S 1				191	4 15	·763	?819
Series 202	21 1	·77	00	..	0	..	0	3 71	811	8 75	..	0	..	0	20·	4 24	·738	668
	22 1	75	00	N	9	N	9	3 59	86·	74	N	3	NW	4	20·	4 23	·73·	63
	·3 1	03	00	.	0	W	9	3 79	826	63	..	0	N & W	11	208	4 25	·736	12)
	,	,,	,,	,,	,,	,,	,,	,,	842	71	,,	,,	,,	,,	,,	4 26	·74·	,,
	18·3	·80	00	..	0	.	0	3 68	82·	86	..	0	..	0	180	3 99	·767	73
	24 2	·68	00	..	0	S	1	3 53	85·	68	..	0	S	1	182	3 99	·75·	161
	17 1	0·	+ 03	NW	2	NW	8	3 78	8·2	63	N	7	NW	3	210	4 26	·756	2981
? Range		20	..	..	..	..	.	26	040	23	..	..	..	..	030	27	032	2918
? Means of 7		73	..	NW 3				3·70	840	8 72	N & W 3				200	4 17	·74·	600

Series 203.	25-3	38	00	0 76	3 61	8 64		00 187 0	..	0	S	11	P	5 193	3	00	S	l	S	8	3 33	922	8·64	.	0	S	11	168	3 81	800	81
	20-3	150	00	0 60	3 67	56	–		.	0	..	0	P	5 174	3	– 02	.	0	.	0	3 43	901	50	..	0	.	0	188	4 01	771	124
	25 1	284	00	?	?	52			N	l	.	0	P	5 311	3	00		0	N	l	3 60	880	52	N	l	..	0	218	4 31	742	108
	25 2	0	00	1 17	3 40	52	–		.	0	N	l	A	5 083	3	– 01	N	l	N	l	3 64	841	52	.	0	N	l	185	3 97	771	103
	,,		,	1 21	3 30	48	–		N	l	N	7	P	4 984	3	,	,	,	,,	,	,	827	48	,	,,	,,	,	,	3 96	770	,
	16 1	298	00	?	?	·42	+		S	5	.	0	P	5 255	3	00	S	8	,,	0	3 57	596	42	S	5	.	0	200	4 10	780	342
	15 3	93	00	1 03	3 64	41	+		.	0	N	l	P	5 105	3	+ 05	..	0	..	0	3 68	815	41	..	0	N	l	188	3 98	781	90
	14 3	134	00	0 58	3 35	37	–			0	.	0	A	4 753	2	..	.	.	.	.	?	l	37		0	..	0	?175	?3 83	? 760	186
	27·1	280	00	0 96	3 51	·31			S	l	..	0	A	5,142	3	+ 02	..	0	..	0	3 57	888	31	S	l	..	0	205	4 13	768	138
δ Range		298	00	? 63	? 31	33	..		..	..	..	.		558		..	..	..	.	.	? 35	? 095	33	..	..	.	..	?050	? 50	? 084	049
γ Means of 9		142	00	? 90	?3 51	8·47	..		S 1					5,112	3	..	? S 1				?3 50	? 876	8 47	S 1				?191	?4 01	? 771	430
Series 204.	21 3	140	00	0 73	3 34	8 28	–		..	0	.	0	P	4 815	2	00	..	0	..	0	3 35	890	8 28	..	0	..	0	180	3 86	774	55
	13-3	171	00	1 13	3 59	27	+		S	l	..	0	P	4 900	3	..	..	.	..	.	l	?	27	S	l	.	0	203	4 10	740	134
	27 2	0	00	0 75	3 22	28	–		..	0	..	0	A	4,769	2	– 01	..	0	..	0	3 44	860	28	..	0	..	0	188	3 95	740	144
	,	,	,	0 77	3 20	26	–		..	0	N	l	P	4,796	2	,,	,,	,	,,	,	,,	869	26	,,	,	,,	,	,	3 94	759	,,
	22 3	150	00	0·75	3 39	26	–		..	0	..	0	A	4 781	2	·00	..	0	..	0	3 35	887	26	.	0	..	0	188	3 94	754	666
	24-3	51	00	0·71	3 30	25	–			0	..	0	P	4 725	2	·00	..	0	..	0	3 38	870	25	..	0	..	0	185	3 91	752	298
	18-2	117	·19	0 63	3 11	24	–		N	l	..	0	P	4 941	3	00	.	0	N	l	3 46	890	24	N	l	..	0	195	4 01	768	859
	28-2	0	00	0 53	3·24	21	–		..	0	N	l	A	4 786	3	00	N	l	N	l	3 37	890	21		0	N	l	235	4 58	655	84
	17 2	127	28	0 36	3 11	21	+		N	l	N	l	A	4 718	2	+ 01	N	l	N	l	3 58	824	21	N	l	N	l	205	4 10	720	98
	20 2	155	28	1 07	3 10	20	–		..	0	.	0	A	4 777	2	00	..	0	..	0	3 61	828	20	..	0	..	0	193	3 98	751	105
	21 2	153	28	0 84	3 03	14			..	0	N	l	P	4 769	3	00	..	0	..	0	3 50	860	14		0	N	l	190	3 93	766	293
	22 2	174	28	0·95	3 02	13			..	0	..	0	A	4 830	3	00	N	l	N	l	3 51	869	13	..	0	..	0	190	3 93	776	59
	6 2	217	·08	0 76	3 32	11			..	0	N	l	A	4,801	3	00	..	0	N	l	3 62	840	11	..	0	N	l	203	4 06	749	60
	26-1	280	00	1 02	3 25	·08	+		..	0	..	0	P	4,031	3	00	..	0	..	0	3 47	905	08	..	0	..	0	215	4 17	755	1258
δ Range		280	09	83	56	20	..		..	..	..	..	..	223		..	..	..	..	..	? 27	? 081	20	..	..	..	.	075	72	121	1203
γ Means of 14		124	·00	79	3 23	8 21	..		N l				..	4,810	3	..	? N l				?3 47	? 868	8 21	N l				198	4 03	747	304
Series 205	7 2	257	00	0·79	3 28	8 08	–		..	0	N	l	P	4,791	3	– ·02	..	0	..	0	3 60	847	8·08	..	0	N	l	203	4 05	753	241
	8 2	247	00	0 94	3 23	03			N	l	..	0	A	4 826	3	00	..	0	..	0	3 57	866	·03	N	l	..	0	200	4·01	771	96
	30 1	263	00	1·03	3 19	7 99			..	0	..	0	A	4,745	3	00	..	0	..	0	3 53	867	7 99	..	0	..	0	218	4 17	734	66
	10-2	247	47	0 84	2 88	96			..	0	..	0	P	4 724	3	·00	..	0	..	0	3 44	887	96	..	0	..	0	200	3 99	764	108
	31-1	255	·00	0 95	3 12	88			NNW	7	NW	5	P	4 718	3	00	NW	6	N	9	3 58	860	88	NNW	7	N	5	220	4 16	740	139
	4 2	255	·00	0·68	3 19	80			..	0	..	0	P	4,791	3	00	..	0	..	0	3 46	890	80	..	0	..	0	208	4 03	·764	561
Range		16	47	35	40	28	..	2	..	..	..	.	..	108		..	..	..	..	..	·16	·043	28	..	.	..	..	020	18	037	495
γ Means of 6		254	08	87	3 16	7 96	..	187 3	NW & N 1				.	4,766	3	..	NNW 1				3 53	870	7 96	NW & N 1				208	4 07	754	202

CENTRAL SURFACE AND MEAN VELOCITIES

TABLE LXVII.

BELRA SITE

[The Upper Sub-Reach is about 1 mile long and the Lower about 4 miles]

[The Surface-Slope (S) is the mean of measurements on both banks (given in Tables L LI.) the state of the Wind is given for each]

Serial No.	Date 1899	2 Control: Tail of Reach: With drawn by Distributaries Q	2 Control: Tail of Reach: Average Obstruction k	2 Fall of Water Surface: Upper Sub-Reach F_1	2 Fall of Water Surface: Lower Sub-Reach F_2	3 Rod-Velocity Results: Hyd Mean Depth m	3: Variation of water level	3: Surface Breadth b	3: Wind From Direction	3: Wind From Velocity	3: Wind To Direction	3: Wind To Velocity	4 Central Surface Velocity Results: Hyd Mean Depth M	4: Variation of water level	4: Wind From Direction	4: Wind From Velocity	4: Wind To Direction	4: Wind To Velocity	4: Central Surface Velocity (Mean of 4 trials) v_s	4: Ratio $V - v_0$ / c	5 Surface-Slope Results: Hyd Mean Depth m	5: Wind 1st Slope Direction	5: Wind 1st Slope Velocity by	5: Wind 2nd Slope Direction	5: Wind 2nd Slope Velocity	5: Surface Slope Bank s	5: $\frac{1}{100}\sqrt{RS}$	5: Ratio $V - w$ / C	6 Silt in grains per cub ft q
Series 206.	8-2	255	00	0·84	2·88	7·77	00	187·0		0		0	7·77	00	·	0	·	0	3·43	886	7·77	·	0		0	2	·	736	99
	7-3	147	00	0·72	3·05	70	− 03	186·9		0	·	0	71	+ 01	·	0		0	3·28	875	70		0	·	0	2		714	158
	8-3	147	00	0·74	2·83	69	00	9	..	0	..	0	68	00	·	0		0	3·29	875	69	..	0	..	0	1		736	5233
	6-3	198	00	0·75	3·09	68	00	9	N	1	·	0	68	00		0	·	0	3·47	839	68	N	1	..	0	2		725	58
	3-3	156	00	0·85	2·87	63	+ 02	9	N	6	N	5	64	00	N	5	N b W	7	3·26	856	63	N	6	N	5	1		721	81
	11-2	247	·56	1·03	2·49	62	− 05	9	..	0	..	0	61	+ 03	·	0	..	0	3·32	904	62	·	0	..	0	?1		? 773	818
	4-3	151	00	0·74	2·93	60	00	8	V	2	N	1	52	− 02	NW	8	NW	4	3·47	806	60	N	1	N	2	2		746	127
	13-2	217	56	0·84	2·43	57	00	8	·	0	N	1	57	00	N	7	·	0	3·52	869	57	..	0	N	2	?1		? 801	99
	14-2	191	56	0·82	2·30	50	00	7	·	0	·	0	50	00	..	0	..	0	3·38	870	50	..	0	..	0	?1		? 770	171
	15-2	191	56	0·74	2·35	48	00	7	E	5	·	0	48	00	SE	8	·	0	3·37	855	48	E	5	·	0	?1		? 758	219
	11-3	147	00	0·69	2·86	47	− 05	7	·	0	N	19	46	− 02		0	N	1	3·48	830	47	..	0	N	19	1		751	48
	10-3	147	00	0·72	2·85	46	− 02	7	..	0	..	0	46	− 02	N	1	..	0	3·40	829	46		0	..	0	1		702	123
a Range		108	56	34	70	31	·	3	..	..	..	·	31	·	..	..	..	·	26	075	31	..	..	..	·	?0		? 087	5185
b Means of 12		183	19	79	2·74	7·60	..	186·8	N b E 1				7·59	·	N b W 1				3·39	862	7·60	N b E 1				?2(		? 749	601

CENTRAL SURFACE AND MEAN VELOCITIES

JAOLI SITE

(The Lppe S b-R achis abou ½ mile ng and th Lower abou 5 miles

(The Surface-Sl pe S) is he m an f measurements on both banks g ven Tables L L ta e o e W d g on for ne L

Series																														No Observations
Series 211	9 1	59	·00	3		86	+ 01	19 8	V	l	V	l	S	4	00	V	l		0	3 48	879	7 80	V	l	V	l	?178	?3 74	? 818	
	7 1	59	? 00	3		86	− 05	8	V	g		0	S	4	·00	SW	4	S	5	3 47	8·6	80	W	3		0	178	3 4	791	
		59	? 00	3		86	− 02	8	W	3	V	l	R	4	00	SW	6	V	l	3 46	847	80						3 74	783	
	8 1	59	? 00	·3		83	00	8	N	4	V	l	R	4	00	N	7	W	3	3 53	837	83	N	4	V	l	183	3 79	784	
	17-3	44	00	3		89	− 04	6	NW	10	W	20	R	4	− 02	W	17	N V	8	3 33	849	82	NW	10	W	20			831	
	27 3	0	00	5		·97	− 12	9		0		0	S	4	− 02		0	V	l	3 44	863	77		0		0			816	
	10 1	59	·00	3		75	00	7	N	6	NE	7	R	4	+ 01	N	8	N	2	3 46	864	75	N	6	NE	7			804	
	11 1	59	00	4		73	+ 02	7	E	4	V	l	S	4	00	N	4	E	5	3 30	900	73	E	4	V	l			80	
	6 1	75	? 00	3		·70	00	7	S	5	W	3	S	4	00	S	3	V	l	3 37	8·5	70	S	5	W	3			776	
	δ Range	75	? 00	2		27		3												25	063	27							? 058	
	γ Means of 9	53	? 00	·3		82		19·8	NW b W 2					4		WNW 2				3 43	861	7 82	NW b W 2				?		? 802	
Series 212	18-3	90	00	3		64	− 04	192 4	W	l	SW	9	R	4	− 02	S	8	W	10	3 16	911	7 64	W	l	SW	9			847	
	24 ?	0	00	3		·51	− 08	3		0	S	13	S	4	·00		0		0	3 30	879	51		0	S	13			871	
	21 1	53	00	3		46	04	3		0	S	4	S	4	00	S	l	S	l	3 28	918	46		0	S	4			840	
	2? 1	53	00	3		39	− 02	2	NW	7	W	17	R	4	− 02	W	17	NW	17	3 40	89	39	NW	7	W	17			8·	
	2· 2	0	00	2		·38	00	2		0	N	8	R	4	00	N	8	N	7	3 40	830	38		0	NW	6			862	
	23 1	59	00	3		36	00	2	NW	4	W	2·	S	4	00	W	6	W	14	3 36	878	36	NW	4	W	25			831	
	δ Range	90	00	0		28		2												·24	088	29							040	
	γ Means of 6	43	·00	3		46		19·3	W b S 5					4		W b N 5				3 32	880	7 46	W b S 5						853	
Series 213	15-3	44	00	29	4 9	7 40	+ 20	192 1	SW	5	W	3	R	4	+ 04	W	7	N	8	3 43	822	7 40	SW	5	W	3			873	
	2 2	0	00	30	5 12	36	− 02	1	N	6	NW	6	S	4	00	N	8	N	7	3 40	844	36		0	NW	6			878	
	2· 3	100	00	31	5·08	28	+ 02	1	E	17	E	17	S	4	00	E	20	E	17	3 25	89·	28	E	17	E	17			860	
	17 1	63	00	3·	4 9·	19	− 02	1	W	11	W	14	R	4	00	NW	8	W	7	3 40	865	19	W	11	W	14	?		? 872	
	18-?	80	1 00	·26	4 28	17	00	191 9	N	4	N	8	S	4	00	N	4		l	3 42	8?·	17	N	4	N	8			904	
	17 2	20	1 00	23	4 16	15	+ 02	9	N	6	W	4	R	3	+ 04	S	3	W	6	3 32	834	15	N	6	W	4			871	
	16 1	59	00	22	5 00	02	− 04	9		0	V	l	S	4	− 02		0	V	l	3 27	911	0?		0	V	l			876	
	δ Range	100	1 00	12	96	38		?												18	089	38					?		? 035	
	Mean of 7	52	29	29	4 80	7 2?		19·0	N b W 2					4	..	NNE 2				3 36	857	7 92	N b W 1				?		? 878	

CENTRAL SURFACE AND MEAN VELOCITIES

JAOLI SITE

TABLE LXVIII.

[The Surface Slope (S) is the mean of measurements on both banks given in Tables LII. LIII. the state of the Wind is given for each]

Serial No.	1	2				3							4							5						
		CONTROL		FALL of Water Surface		ROD VELOCITY RESULTS			WIND				MEAN VELOCITY	CENTRAL SURFACE VELOCITY RESULT		WIND					SURFACE SLOPE RESULTS						
	DATE 1879	Tail of Reach: Withdrawn by Distributaries Q	Tail of Reach: Average Obstruction n	Upper ½ mile F_1	Lower ½ miles F_2	Hyd Mean Depth m	Variation of water level	Surface-Breadth b	From: Direction	From: Velocity	To: Direction	To: Velocity	V	Hyd Mean Depth m	Variation of water level	From: Direction	From: Velocity	To: Direction	To: Velocity	Central Surface Velocity (Mean of vel. obs.) v_s	WIND 1st Slope: Direction	WIND 1st Slope: Velocity	WIND 2nd Slope: Direction	WIND 2nd Slope: Velocity	Surface-Slope (both banks)	10 of 100 √Rs	Ratio $\frac{V}{v_s} = c$
Series 214	20 3	80	00	28	4 01	7 14	− 06	191 8	W	8	W	11	2 82	7 11	+ 02	W	7	W	8	3 17	W	8	W	11			892
	19 3	41	00	28	4 80	00	+ 32	7		0	N	11	2 82	00	+ 12	•	0	•	0	3 31		0	N	11			842
	27 2	0	00	21	4 98	06	− 04	8	W	10	NW	13	2 81	00	+ 02	W	25	W	11	3 39	W	10	NW	13			889
		0	00	21	4 25	06	00	8	W	10	NW	20	2 79														883
	20 2	30	00	25	4 8	05	00	8	NW	16	W	7	2 74	05	00	NW	6	W	14	3 25	NW	16	W	7			907
	25 1	63	00	33	4 76	02	00	8	W	6	W	12	2 89	09	00	NW	6	W	6	3 18	N	6	N	12			898
	23 •	0	00	25	4 84	02	− 04	7	NW	10	W	33	2 77	04	00	SW	3	SW	7	3 22	NW	10	W	33			874
	27 1	63	00	32	4 8	6 98	− 04	7	E	6	E	5	2 87	6 98	− 04	E	9	E	8	3 28	E	6	E	5			875
s Large		80	00	09	00	16	•	1	•	•			10	13	•	•	•	•		22	••	•	•				065
v Means of s		30	00	28	4 70	7-05		191 8	WNW 9				2 81	7-01		W 7				3 27	WNW 9						878
Series 215	21 3	90	00	27	4 76	6 99	− 00	191 6	W	8	W	14	8	3 701	2 76	6 90	− 02	W	13	W	17	3 17	W	8	W	14			804
	21 2	20	00	31	4 66	90	− 00	6		0	N	5	8	3 766	2 76	90	00	NW	1	N	7	3 32		0	N	5			905
	24 3	90	00	23	4 8	89	+ 04	6	W	20	W	20	8	3 923	2 88	89	+ 02	W	10	W	20	3 22	W	20	W	20			903
	2 • 3	00	00	23	4 76	89	+ 00	6	SW	8	SW	17	R	3 878	2 85	89	+ 02	SW	13	SW	13	3 09	SW	8	SW	17			893
	2 • 2	0	00	28	4 66	88	00	6	••	0	NW	1	R	3 758	2 76	88	00	NE	4	W	7	3 27	•	0	NW	1			906
	25 1	63	00	24	4 5	76	− 04	5		0	SW	6	S	3 646	2 73	76	00		0	S	2	3 16		0	SW	6			872
	8 2	0	1 00	20	3 80	76	00	4	SW	10	W	11	R	3 565	2 67	76	00	W	7	W	8	3 16	SW	10	W	11			887
	16 1	59	00	18	4 61	67	+ 05	5	S	7	V	1	R	3 787	2 95	67	+ 04	V	1	V	1	3 21	N	3	V	1			863
	10 2	0	1 00	23	3 9	62	− 04	4	•	0	N	3	S	3 617	2 77	62	− 02	N	6	N	8	3 26	••	0	N	3			906
	14 1	59	00	6	4 63	60	+ 05	4	W	8	W	10	R	3,757	2 89	61	+ 02	NW	10	NW	5	3 28	W	8	W	10			867
L Large		90	1 00	23	1 00	32	•	2	•	•	••			358	27	29	•	•	•		23	••		•			•	072
v Means of 1		47	00	25	4 00	6 75		191 5	W b S 7					3 740	2 80	6 75		W b N 5			3 21	W b S 7						892

Series 216. 6 2	95	1 00
30·1	75	00
7 2	0	1 00
4 2	95	1 00
7 3	0	00
15 1	59	00
8·3	0	·00
31 1	75	1 00
6 3	0	00
δ Range	95	1 00
υ Means of 9	44	44
Series 217. 3 2	95	1 00
14 2	0	1 00
4 3	0	00
11 2	0	1 00
13 2	0	1 00
11 3	0	00
δ Range,	95	1 00
υ Means of 6,	16	67

6 66	00	191 3	W 14	W 20	R
·59	00	·3	. 0	W 6	R
57	00	2	W 9	NW 10	S
55	00	2	N 3	S 4	S
51	+ 02	1	.. 0	NNW 5	S
48	+ 06	·3	N 3	.. 0	S
48	+ 10	1	.. 0	SW 8	R
47	00	2	W 20	W 25	S
45	00	1	NW 11	W 10	R
21	..	2	.. ..	.. .	
6 53	.	191 2	W b N 7		
6 37	00	191·0	SW 11	SW 13	R
36	00	190 9	V 7	N 3	R
35	+ 04	191 0	SW 6	W 25	B
34	− 06	190 9	E 4	SE 4	R
·32	− 04	9	W 14	W 25	S
20	00	8	E 11	SE 7	B
17	.	2	.. ..	.. .	..
6·32	..	190·9	WSW 6		..

00	W 19	W 14	3 05	901	6 66	W 14	W 20		883
00	W 2	SW 7	3 19	890	·59	. 0	W 6		931
00	W 20	SW 16	3 21	801	57	W 9	NW 10		845
00	.. 0	S 7	3 15	832	55	N 3	S 4		879
+ 02	.. 0	. 0	3 20	850	51	. 0	NNW 5		892
00	.. 0	0	3 19	890	48	N 3	V 7	.	866
+ 02	S 8	SW 7	3 07	860	48	.. 0	SW 8		880
00	W 33	SW 29	3 04	885	47	W 20	W 25		876
00	W 10	W 7	3 14	854	45	NW 11	W 10	.	899
..	.. .	.. ..	18	100	21	.. ..	.. .		086
..	WSW 9		3 14	863	6 53	W b N 7			·883
00	SW 11	SW 8	3 02	861	6 37	SW 11	SW 13	.	887
00	V 7	V 7	3 18	830	36	V 7	N 3		901
+ 02	NW 25	NW 20	3 17	833	35	SW 6	W 25		866
+ 02	. 0	S 6	3 12	840	34	E 4	SE 4		877
+ 02	W 20	W 20	3 03	861	32	W 14	W 25		882
00	.. 0	.. 0	3 04	868	20	E 11	SE 7		901
..	.. ..	.. ..	·16	038	·17	.. ..	.. .		035
..	W b N 7		3 00	850	6 32	WSW 6			880

CENTRAL SURFACE AND MEAN VELOCITIES

KAMHERA SITE

TABLE LXIX.

The Surface-Slope (S) is the mean of measurements on both banks (given in Tables LIV LV) the state of the Wind is given for each

Serial No.	Date, 1879	1	2				3											4								5					
			Control		Path of Water		Rod Velocity Results																				Surface Slope Results					
			Tail of Reach							Wind								Wind								Wind					
										From		To						From		To						1st Slope.		2nd Slope			
			Withdrawn by Evaporation	Average Obstruction	Upper ⅔ miles	Lower ⅔ miles	Hyd Mean Depth	Variation of water level	Surface-Breadth	Direction.	Velocity.	Direction	Velocity	Time-keeper's Initial	Cubic Discharge in cub feet per sec.	Mean Velocity	Hyd Mean Depth	Direction	Velocity	Direction	Velocity	Central Surface Velocity (Mean of 3 Initials)	Ratio $V - v_0$		Hyd Mean Depth	Direction.	Velocity	Direction	Velocity	Surface-Slope (Both Banks)	Value of $186\sqrt{RS}$	Ratio $V - v$
			Q	k	F_1	F_2	R		b						D	V	I					v_0	c		R					S	v	c
221.			102	1 26	2 82	11 80	4 91	+ 03	65 0	NNW	18	NNW	18	cl	981 6	2 87	4	00	NNW	18	NNW	16	3 54	811	4 91	NNW	16	NNW	18	290	3 77	·761
			102	1 26	2 85	11 84	87	00	5	N	13	N	8	c	967 1	2 85		00	N	7	N	10	3 51	812	87	N	13	N	8	297	3 86	·750
			102	1 26	2 79	11 78	82	− 02	4	..	0	V	1	c	948 0	2 83		02	V	1	V	1	3 26	868	82	..	0	.	0	287	3 78	749
			99	1 26	2 87	11 64	74	− 02	5	NNW	12	NW	7	cl	945 8	2 88		00	NNW	15	NW	8	3 28	878	74	NNW	12	NW	7	298	3 76	766
δ Range,			3	00	08	21	17	..	2	..	..	..	.		35 8	05	.	..	..	..	..	.	28	·067	·17	..	..	..	..	008	04	017
ν Means of 4			101	1 26	2 83	11 80	4 84	..	65 5	NNW	9				960 6	2 86	4	..	NNW	9			3 40	842	4 84	NNW	9			290	3 78	757
Series 222.			80	1			4 76	− 01	66 3	N	11	N	11	cl	9(			00	N	7	NW	8	3 28	830	4 76	N	11	N	11			762
			93	1			62	+ 01	66 4	NNW	10	N	23	c	9			00	NNW	11	N	16	3 52	821	·62	NNW	19	N	23			·794
			98	1			58	00	3	.	0	NW	9	cl	8			00	V	1	NW	11	3 32	809	58	..	0	NW	9			783
			98	1			57	00	3	V	1	.	0	cl	8			00	..	0	..	0	3 33	800	57	V	1		0			794
			98	1			56	00	3	..	0	V	1	c	8			00	V	1	V	1	3 17	884	55	..	0	V	1			761
			92	1			47	00	0	..	0	.	0	c	8		1	·00	NNW	9	NW	13	3 48	·810	54	NNW	9	NNW	10			·786
			,,	,,			46	00	0	,	,	V	1	c	8			00	..	0	V	1	3 26	86	47	..	0	V	1			775
			92	1			46	·00	0	NNW	7	NNW	11	cl	8			,,	,,	,	,,	,	,	868	46	,,	,	,,	,			778
			94	1			44	− 02	64 9	.	0	..	0	cl	8			01	NNW	11	NW	3	3 44	85	46	NNW	7	NNW	11			801
			94	1			43	−·01	9	V	1	V	1	c	8			00	..	0	..	0	3 21	804	44	..	0	..	0			753
			90	1			·42	00	65 0		0	.	0	cl	8		1	00	V	1	V	1	3 12	870	·43	V	1	V	1			740
			,,	,			42	+ 02	1	..	0	V	1	c	8		·42	00	..	0	..	0	3 22	860	42	..	0	..	0			765
			88	1			42	−·02	·1	V	10	N	18	cl	8		,	,,	,,	,	,,	,	,	860	·42	,,	,	,,	,			·770
			,,	,,			42	·00	0	V	19	N	21	c	8		·41	00	N	18	N	19	3 52	810	42	N	10	N	21			808
																	,,	,,	,,	,,	,,	,	,,	810	·42	,,	,,	,,	,,			808
δ Range			18				34	..	1 4	..	.	..	.	.			·34	..	..	..	..	..	40	074	34	..	..	..	..			068
ν Means of 15			93	1			4 50	..	65 2	N	5 W	6		..			·50	..	N	4 W	5		3 32	848	4 50	N	5 W	6				779

Series 223.	22 3	75	1 26	2 60	11 38	4 52	00	60 5	NW 12	NW 11	cl	862 5	2 77	4 52	00	NW 14	NW 11	3 34	830	4 52	NW 12	NW 11	284	3 58	774
	21 3	75	1 26	2 99	11 40	02	00	5	N 13	N 13	c	838 4	2 63	52	00	NNW 12	NNW 12	3 25	820	52	N 13	N 13	288	3 61	743
	20 3	90	1 26	2 63	10 71	40	− 01	64 8	E 9	E 9	cl	817 5	2 72	40	00	E 9	SE 11	2 91	930	40	E 9	E 9	285	3 54	768
	14 1	94	1 26	3·00	11 45	36	− 01	9	N 13	N 13	cl	875 5	2 95	30	00	N 13	NW 10	3 29	807	30	N 11	NW 6	230	3 59	822
	,			2 93	11 46	30	00	9	NW 10	NW 7	c	847 9	2 86						86		,	,	,	3 58	790
	24 3	86	1 26	2 64	11 3	30	+ 02	7	NW 11	NW 10	c	800 0	2 70	30	+ 01	NW 10	NW 9	3 7	85		NW 11	NW 10	288	3 54	763
	8 2	88					00	3	V l	N 7	cl	841 9	2 84	33	00	N 13	N 11	3 34	8		V l	N 7	309	3 66	784
	27 2	44					− 01	6	NW 8	NW 9	c				00	NW 9	NW 11	3 27	80		NW 8	NW 11	304	3 63	769
	,	,					00	6	NW 11	NW 11	cl								80		,	,		3 63	766
	28 2	28					00	6	NW 10	NW 11	c				00	NW 11	NW 11	3 22	86		NW 10	NW 11			767
	18 1	81					00	4	N 15	N 16	cl				00	N 16	N 16	3 39	83		N 15	N 16			785
δ Range,		6						1 2	..	. .								48	11		.. .				079
v Means of 11		7						64 8	NNW 9							NNW 9		3 25	86		NNW 9				776
Series 224.	22 2	7					00	64 5	. 0	0	c				00	0	0	3 04	92		.. 0	. 0			792
	4 3	6					00	5	V l	NW 15	cl				00	NW 11	NW 12	3 18	87		V l	NW 1			772
	27 3	8					00	4	. 0	0	c				00	0	0	3 04	86		. 0	. 0			781
	3 3	7					00	7	NW 19	NW 17	cl				00	NW 18	NW 18	3 35	81		NW 9	NW 1			798
	11 2	8					00	2	. 0	V l	cl				00	. 0	V l	3 00	91		0	V			763
	10 2	7					00	2	V l	V l	c				00	V l	V l	3 03	90		V l	V			798
	22 1	8					00	3	N 13	N 15	cl				00	N 14	N 18	3 44	8		N 13	N 1			796
	13 2	8					00	1	N 14	N 14	c				00	N 12	N 14	3 35	8		N 14	N 1			789
	21 1	8					00	3	.. 0	.. 0	c				00	. 0	. 0	3 25	8		0	.			769
	21 2	5					00	1	.. 0	V l	cl				00	V l	V l	3 09	8		0	V			754
	20 2	5					00	0	.. 0	V l	cl				00	. 0	.. 0	3 14	8		.. 0	..			765
	,,	,					00	0	,, ,	,, ,	c				,,	, ,	, ,	,,	8		,, ,,	,,			762
δ Range		8					..	5	.. ..	.. .					..	. .	.. .	44	1		.. /	. .			045
v Means of 11		5					..	64 3	NNW 4							NNW 5		3 17	8		NNW 4				769
Series 225.	18 2	7					00	64 1	.. 0	. 0	c				00	. 0	.. 0	3 14	8		. 0				772
	17 2	7					00	1	.. 0	. 0	cl				00	. 0	0	3 14	8		.. 0				787
	8 3	7					+ 01	2	.. 0	. 0	cl				+ 01		0	3 17	833	12	0	.			744
	10 3	8					− 02	1	NNW 12	NNW 13	c				00	NNW 11	NNW 12	3 14	860	09	NNW 12	NNW 1			771
	11 3	7					00	1	N 6	N 13	cl				00	NNE 7	NE 9	3 04	898	08	N 6	N 1			776
	17 3	7					− 01	1	NNW 16	NNW 18	c				00	NNW 14	NNW 14	3 20	841	08	NNW 16	NNW 1			763
	13 3	8					00	1	.. 0	.. 0	c				00	.. 0	.. 0	3 08	870	08	.. 0	..			768
	14 2	7					00	63 9	.. 0	.. 0	cl				00	V l	V l	3 03	904	07	.. 0	..			774
	7 3	7					00	64 1	. 0	.. 0	c				00	.. 0	.. 0	3 08	873	06	.. 0	.			758
	18 3	7					− 02	1	. 0	V l	cl				− 02	. 0	V l	2 90	814	05	.. 0	V			761
	20 2	7					00	63 9	V l	V l	cl				00	V l	V l	3 13	872	04	V l	V			776
	15 3	7					00	9	N 3	V l	cl				00		0 .	3 05	879	04	N 3	V			768
	6 3	7					00	64 0	V l	V l	c				00	NW 11	NW 6	3 14	841	02	V l	V			742
	15 2	7					00	63 7	SE 8	NE 6	c				00	E 6	NE 7	3 10	897	00	SE 8	NE			773
δ Range,		6					..	5	. ..	..				13		.. .	.	30	081	·13	.. .	..			045
ans of 11		6					..	64 0	N & W 3					4 07	..	N & W 3		3 10	875	4·07	N & W 3				760

TABLE LXX.

CENTRAL SURFACE AND MEAN VELOCITIES

Sites in Distributaries

Serial No	1	2	3									4							DISTRIBUTARY
			Rod Velocity Results									Central Surface Velocity Results.							
	Date 1879	Lon t o	Hyd Mean Depth	Variation of water level	Surface Breadth	Wind From	Wind To	T m keepe r Init a	Cub o d schargo in c b fee per sec	Mean Velo ty		Hyd Mean Depth	Variation of water level	Wind From	Wind To	Cent Surface Velo ty	Ratio V — v_o		
		Fall of Water-Surface				Direct on Velo y	Direct on Velo y							Direc ion Velo ty	Direct on Velo y				
			R		b				D	V		R				v_o	c		
231	29-3	?	?	2 79	00	25 0	0	0	C	190 7	2 51	} 2 79	00	0	0	2 95	{ 851		RIGHT JAGHI
		?	?	79	+ 02	0	0	0	B	191 1	2 52						854		
δ Range,				00		0				4	01						003		
v Means of 2				2 79		25 0	Calm			190 9	2 5	2 79		Calm		2-95	853		
232	28-3	?	?	1 99	- 02	20 0	0	0	C	97 7	2 10	} 1-98	00	0	0	2 51	{ 83		
		?	?	98	00	0	0	0	B	97 7	2 10						83		
δ Range,				01		0				0	00						000		
v Means of 2				1-99		20 0	Calm			97 7	2 10	1-98		Calm		2 51	83		
233	13-3	Not observed		30	+ 05	14 3	0	0	B	90-5	2 14	} 2 17	- 03	0	0	2 49	{ 860		MANSURAM
				33	15	3	0	N 1	C	89 5	2 14						860		
	18-3			31	+ 06	0	0	0	C	84 9	2 10	} 2 09	+ 02	0	0	2 43	{ 864		
				28	00	0	0	0	B	80 6	2 03						83		
δ Range,				07		3				9 9	11	12				06	029		
v Means of 4				2 30		14 2	N 1			86 4	2 10	2 03		Calm.		2 46	850		
234	1 -3	?	?	10	00	13 8	0	0	C	72 6	2 01	2 10	00	0	0	2 44	840		
236	21 3	?	?	1 16	00	10 0	W 1	W 2	B	20 3	1 4	} 1 16	- 06	W 2	NW 2	1 9	{ 8		MUHURI R
		?	?	16	+ 01	5	NW 2	NW 2	C	20 7	1 4						83		
δ Range,				00		0				4	01						000		
v Means of 2	?	?		1 16		13 0	W N W 2			20-0	1 4	1 16		W N W 2		1 9	83		
237	19 3	?	?	2 16	- 01	13 0	NW 2	W 2	C	69 8	1 82	} 2 1	- 02	NW 2	NW 2	2 26	{ 80		TUKIA
	"	?	?	16	+ 06	0	NW 1	NW 1	B	63 3	1 84						814		
δ Range,				00		0				5	0						009		
v Means of 2	?	?		16		13 0	NW 2			63 1	1 8-	2 1		NW 2		2 26	810		
238	20-3	?	?	1-96	- 09	12 0	0	W 1	B	50 2 1		} 1-94	- 05	W 1	W 1	2-09	{ 8-0		
		?	?	91	- 06		W 1	W 1	C	47 9 1	1						818		
δ Range,				05		0				4 3	05						03		
v Means of 2	?	?		1 94		12 0	W 1			50-0	1	1 94		W 1		2-09	83		

TABLES LVII. AND LXXI—LXXIV.

MISCELLANEOUS VELOCITY EXPERIMENTS.

Series 241 to 243, (Table LVII) are Surface-, Bed, and Rod Velocity work executed in concert, the velocity measurements of each kind were made in as rapid succession as possible, one after the other, upon each vertical from Left Bank to Right Bank. Thus one SET of each kind was executed under the same External Conditions, and the Mean Results of each SERIES are therefore completely intercomparable, being under same conditions, (though not freed from effects of Unsteady Motion) For explanation of arrangement of Table, *see* pages 57, 67

Series 251, 252 are Experiments on Length of Run. Each Float was timed in passing under 4 Ropes in succession, so that velocity measurements are deducible from the same Float through four different RUNS. The discrepancies are shown in the bottom lines (marked δ)

Series 251 contains 4 SETS of Mean Velocity work (*i e*, 1 Set for each of the four Runs) similar to those of Tables L., LI For explanation, *see* page 67

Series 252 contains the "Timings" (through the four Runs) of the 48 Floats used for a single Average Central Surface Velocity Measurement (v_o), as used in Col. 4 of Tables LVIII. to LXX.

Tables LXXIII and LXXIV illustrate Unsteady Motion. Table LXXIII. is a selection (from Tables LVIII. to LXX) of 17 Sets of Central Surface Velocity-Measurements, (each Set consisting of 48 trials done in rapid succession) showing the maximum, minimum and mean velocity Results, and also the Range thereof in each Set (both actual and per centum) at eight different Sites, as well as the duration of each Experiment (in minutes), the state of the Wind at beginning and end thereof, and the maximum Deviation (from the Pendants of Upper and Lower Ropes) admitted for each Float.

Table LXXIV is a similar selection of 10 Sets of Central Velocity-Measurements at various depths with different Instruments at two Sites, showing Results as in Table LXXIII These Sets do not appear in the Tables preceding this.

EXPERIMENT ON LENGTH OF RUN. TABLE LXXI.

Mean Velocities and Discharges—Belba Site.

[*Instruments*—1" *tin Tube-Rods*]

These 4 Sets were executed together throughout, (the four velocity measurements of each Float-Course being taken *from the same Float*) so that the External Conditions are the same for all 4 Sets

Serial No.	1	2					3	4	5														6	7	8
	Date, 15 9	Depth.			Surface-Breadth	Area.	Wind	Timekeeper's Initial	Mean Velocities past each vertical. Each Float was timed in passing under four Ropes in succession by same Timekeeper. [Each Velocity is the mean of three observations].														Cubic Discharge in cub feet per sec	Mean Velocity.	Length of Run
		At Gauge.	Variation	Central.					Left of centre							Centre	Right of centre									
									Edge	Side-slope m	Side-slope 90	80	70	60	40	20		20	40	60	70	80	Side-slope 90	Side-slope m	Edge			
		h		H	s	A																			D	V	
251	11 2	5 88	− 03	8 12	180·0	1473 4	Calm	P	?o	1 76	2 03	2 88	2 68	3 06	3·00	2 94	3 00	3 06	3 23	3·06	2 73	2 50	1 38	1 25	?o	4,30.	2·92	Upper 25' Run
									?o	1 76	2 26	2 94	2 88	3·03	3 13	3 03	3 33	3 03	3 16	3 16	2·94	2 70	1 74	1 52	?o	4,503	3·06	Lower 25 Run
									?o	1 76	2·07	2 84	2 79	3 13	3 09	2 97	3 19	3 19	3 17	3 06	2 87	2 54	1 64	1 37	?o	4,41.	3 00	Middle 50' Run
									?o	?	2 10	2 88	2 78	3 08	3 08	2 98	3 17	3 12	3 18	3 08	2 85	2 57	1 59	?	?o	4,400	2·99	Outer 100' Run
6 Ranges		00	..	·00	0	0	..	.	?	00	23	06	·20	03	13	·09	·33	03	07	10	21	·20	·36	27	?	198	14	In 25' Runs
		00	..	·00	·0	0	..	..	?	?	03	04	01	·05	01	01	02	07	01	02	02	03	0.	?	?	15	·01	In 50' & 100' Runs

EXPERIMENT ON LENGTH OF RUN

TABLE LXXII

Central Surface Velocities—Delta Site

[Instrument—3″ Surface Floats]

Date 13 2 79—Gauge-Depth $h = 5.52$ Variation = 00 Central Depth $H = 6.06$ Surface Breadth $b = 180.8$ Wind Down stream Light at first Calm at ends

These 4 Sets were executed together throughout the four velocity measurements of each Float-Course being taken *from the same Float*) so that the External Conditions are the same for all 4 Sets

Serial No.	Date	Run	Timekeeper	Timings of Floats (Each Float was timed past four Ropes in succession by same Timekeeper) — Number of Float 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Time Unit
252	13-2-79	Upper 25	A	28	27	30	27	30	30	30	27	26	29	26	28	30	31	30	30	29	30	30	30	30	28	28	30	Quarter seconds
		Lower 25	A	28	26	30	26	26	30	32	26	25	28	29	28	29	26	28	28	28	28	30	30	28	30	32	30	Quarter seconds
		Middle 50	A	26½	26½	29	27½	26½	29	31	27½	27	28	27	28	27	32	31	28	27½	29	30	28	29	28	29½	29	Half seconds
		Outer 100	A	27¼	26½	29½	27	27¼	29½	31	27	26½	28¼	27¼	28	28¼	30¼	30	28½	28	29	30	29	29	28½	29¾	29	Seconds
δ Range		of 25 Runs,		0	1	0	1	4	0	2	1	1	1	3	0	1	5	2	2	1	2	0	0	2	2	4	0	Quarter seconds
		of 50 & 100 Runs		¾	0	½	½	¾	½	0	½	¾	¼	¼	0	1¼	1¾	1	½	½	0	0	1	0	½	¼	½	Half seconds

				Number of Float. 25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	
252	13-2-79	Upper 25	P	28	29	30	28	27	29	30	28	29	28	30	28	28	26	31	32	28	29	29	30	31	36	28	34	Quarter seconds
		Lower 25	P	28	27	28	29	30	27	26	29	28	25	30	28	30	28	32	29	32	27	27	29	29	28	29	27	Quarter seconds
		Middle 50	P	28	28½	28	26	26	28	27½	28	27	29	30	29	28	2,½	31½	31½	28	29	28	27	30	31	27½	29½	Half seconds
		Outer 100	P	28	28¼	28½	27¼	2,½	28	27¾	28½	27½	27¾	30	28½	28½	27¼	31½	31	29	28½	28	28½	30	31½	28	30	Seconds
δ Range		of 25 Runs,		0	2	2	1	3	2	4	1	1	3	0	0	2	2	1	3	4	2	2	1	2	8	1	7	Quarter seconds
		of 50 & 100 Runs		0	¼	½	1½	1¼	0	¼	¼	¼	1½	0	½	½	¼	0	½	1	½	0	1¼	0	½	¼	¼	Half seconds

UNSTEADY MOTION—CENTRAL SURFACE VELOCITIES

TABLE LXXIII

[Instruments—3″ Surface Floats]

These Sets are selected from those in Tables LVIII to LXX two Sets for each S to one near the highest and one near the lowest water level available in calm weather

Reference No	DATE 1876 79	SITE	CROSS SECTION DATA: Shape of Section	Surface Breadth	Central Depth	Velocity sought	Instrument	Duration of Experiment in minutes	Number of Trials	WIND: From Direction	WIND: From Velocity	WIND: To Direction	WIND: To Velocity	MAX. DEVIATION admitted: Left	MAX. DEVIATION admitted: Right	VELOCITIES Observed: Max	VELOCITIES Observed: Min	VELOCITIES Means: of first half set	VELOCITIES Means: of last half-set	VELOCITIES Means: of whole	RANGE of velocities: Actual	RANGE of velocities: Per cent (of mean)
1	24 2 79	Jaoli, ...	Trapezoidal	192	8 12	Central Surface Velocity	3″ Surface Floats [3″ × 1″ pine Discs]	30	48	Calm				2′	2′	3 57	2 94	3 31	3 29	3 30	63	19 1
2	11 3 79			191	6 72			35	48	Calm				2′	2′	3 33	2 56	3 02	3 06	3 04	77	25 3
3	27 3 79	Belra . ..	Trapezoidal	189	9 88			35	48	Calm				2′	2′	4 00	3 17	3 61	3 57	3 59	83	23 1
4	14 2 79			187	7 98			35	48	Calm				2′	2′	3 77	3 08	3 39	3 38	3 38	69	20 4
5	23 4 78	Fifteenth Mile, .	Trapezoidal	175	10 04			20	48	Calm				2′	2′	5 00	4 00	4 57	4 59	4 58	1 00	21 8
6	16-4 78			175	9 19			15	48	Calm				2′	2′	5 00	4 00	4 47	4 44	4 46	1 00	22-4
7	29 5 78	Solání Embankment Main Site,	Trapezoid above 4 Rectang e belo v 4	171	11 24			45	48	Calm				2′	2′	4 65	4 08	4 38	4 36	4 37	57	13 0
8	19 9 78		Rectangular	150	2 28			60	48	Calm				2′	2	1 08	88	96	1 00	98	20	20 4
9	31 5 77	Solání Right Aqueduct	Rectangular	82	10 02			70	48	Calm				2′	2′	5 00	4 17	4 56	4 53	4 55	83	18 2
10	31 7 76			85	3 59			20	48	Calm				2′	2	3 03	2 67	2 91	2 89	2 90	36	12 4
11	1 9 76	Solání Right Aqueduct (Left Aqueduct closed)	Rectangular	85	4 00			28	48	Calm				2′	2′	6 67	5 26	5 80	5 75	5 79	1 41	24 4
12	27 1 79	Kambera,	Trapezoidal	65	5 22			40	48	Calm				1′	1′	3 0	3 03	3 35	3 3	3 33	67	20 1
13	15 3 79			64	4 41			40	48	Calm				1′	1′	3 33	2 86	3 04	3 06	3 05	47	15 4
14	29 3 79	Right Jaoli Distributary,	Trapezoidal	25	3 82			50	48	Calm				3″	3″	3 13	2 86	2 96	2 94	2 95	27	9 2
15	28 3 79			22	2 56			40	48	Calm				3	3	2 70	2 33	2 47	2 52	2 51	37	14 7
16	18 3 79	Mansárpur Distributary	Trapezoidal	14	3 39			25	48	Calm				3″	3	2 63	2 27	2 41	2 44	2 43	36	14 8
17	12 3 79			13¾	3 08			55	48	Calm				3″	3″	2 70	2 27	2 42	2 46	2 44	43	17 6

TABLE LXXIV.

UNSTEADY MOTION—CENTRAL VELOCITIES.

[Instruments—Double Floats, Current Meters, and loaded 1" Rods]

* In Sets Nos. 9 and 10 the actual Deviation of each Float was recorded.

Reference No.	Date, 1875 76	Site	Cross-Section Data: Shape of Section	Cross-Section Data: Surface Breadth	Cross-Section Data: Central Depth	Velocity sought.	Instrument.	Duration of Experiment in minutes	Number of Trials	Wind: From Direction	Wind: From Velocity	Wind: To Direction	Wind: To Velocity	Max Deviation admitted: Left	Max Deviation admitted: Right	Velocities: Observed: Max	Velocities: Observed: Min	Velocities: Means: of first half set	Velocities: Means: of last half set	Velocities: Means: of whole	Range of velocities: Actual.	Range of velocities: Per cent. of mean.
1	7-6-77	Solání Right Aqueduct,	Rectangular, ..	82½	9 75	At 5 depth,	Double-Float (1¼" copper Ball),	80	48	?		?		2	2	4 65	3·92	4 35	4 26	4 31	·73	16 9
2	"			"	9 65	*ditto,*	Current Meter, (Moore's)	85	12	V	12	V	20	..	..	4 36	3 84	4 13	4 11	4 12	52	12 6
3	11 3-75	Solání Right Aqueduct,	Rectangular ..	84½	7 55	At 6 depth,	Double-Float, (3" wood Ball)	?	48	..	0	..	0	2	2	3 85	2 78	3 35	3 43	3 39	1 07	31 6
4	"			"	"	*ditto,*	Double Float 3" tin Discs)	?	48	..	0	..	0	2	2	4 08	3 03	3 50	3 42	3 46	1 03	30 3
5	"			"	"	ditto,	Twin 3" wood Balls.	?	48	..	0	..	0	2	2'	4 00	3 08	3 50	3 47	3 48	92	26 4
6	"			"	"	Surface,	3" pine Discs	?	48	..	0	..	0	2	2'	4 17	3 03	3 75	3 80	3 78	1 14	30 2
7	9-6 76	Solání Right Aqueduct,	Rectangular, .	82	9 90	At 9 depth,	Double Float, (1¼" copper Ball)	90	40	E	5	NE	12	2	2	5 00	3 92	4 42	4 37	4 41	1 08	24 5
8	"			"	9 98	*ditto,*	Current Meter, (Moore's)	90	20	NE	12	V	15	..	..	4 74	2 77	3 37	3 50	3 44	1 97	57 3
9	19-3 78	Solání Embankment, Main Site,	Trapezoid above 4, Rectangle below 4,	168	10 25	Surface,	3" pine Discs	225	100	W	5	S	4	*12	*11'	5 13	3 85	4 36	4 33	4 35	1 28	29 4
10	"			"	"	Mean, (on centre vertl.)	1" tin Rod (immersed 9')		100	"	"	"	"	*5'	*5	4 44	3 33	3·95	3 86	3 91	1 11	28 4

TABLES LXXV.—LXXXII.

Water-Level, Surface-Convexity, and Surface-Slope.

Table LXXV shows the Reduced Levels of Water-Surface as determined *in succession*, (not simultaneously) by a Still Water Gauge (Stand-Pipe) and by a Range of Pegs in the Free Channel showing the Still and Free Water-Levels respectively, at the Fifteenth Mile (Old Site) and at the two Slope Points 1000′ above and 1000′ below, Left Bank

Table LXXVI. shows the effect of high cross wind in raising and depressing the Surface Level at the Edges each pair of readings (one for either Bank) being *strictly simultaneous.*

Tables LXXVII. and LXXVIII. show the difference of surface level at opposite banks, and the elevation (or depression) of surface at centre above (or below) the surface at either edge the readings of variable levels (h, C', c', h'', C'', c'') being made *strictly simultaneously*

Tables LXXIX.—LXXXII. show details connected with various Surface-Slope Measurements computed as the quotient,—

$$\text{"Surface Slope} = \frac{\text{Surface Fall in Slope-Length}}{\text{Slope-Length}}\text{"}$$

In every case the two water-level determinations concerned in each (individual) Surface-Slope Measurement were *strictly simultaneous* In all cases 3 decimals (·000) must be prefixed to the Surface-Slope Results by the reader, (these having been omitted to save space)

Table LXXIX shows details of Surface-Slope Measurements in different (2000 and 4000) Slope Lengths on same bank, symmetric about the centre of the Site, those of the 4000′ Slope-Lengths being made about 5 minutes (being the time occupied in traversing the extra distance) after those of 2000′ Slope-Length, and by the same Observers.

Tables LXXX, LXXXI., show details connected with Surface-Slope Measurements on both Banks, each pair by the same Observers. Those on right bank in Table LXXX. were made 2 or 3 hours after (being the time occupied by a Discharge-Measurement) those on left bank at same Site. Those on right bank in Table LXXXI. were made about 2 or 3 minutes after (being the time occupied in crossing the Canal) those on left bank

Table LXXXII shows details connected with Surface-Slope Measurements *executed simultaneously* at three Sites in the Roorkee Reach.

STILL AND FREE WATER-LEVELS

At Fifteenth Mile, (Old Site,) and at (the Slope-Points) 1000 above and 1000' below, (Left Bank)

[*Instruments—Temporary Still Water (Stand-Pipe) Gauge, and Temporary Free (Peg) Gauge*]

(+ and − ind cate Free Water-Level shown by Peg) h gher or lower than S ill Water Level (shown by Stand Pipe)

Date, 18 8.	Water-Level above Experimental Site: Readings on Pipe	Water-Level above Experimental Site: Readings on Peg	Water-Level above Experimental Site: Reduced Level Pipe	Water-Level above Experimental Site: Reduced Level Peg	Water-Level above Experimental Site: Diff	Water Level at Experimental Site: Vely	Water Level at Experimental Site: Readings on Pipe	Water Level at Experimental Site: Readings on Peg	Water Level at Experimental Site: Reduced Level Pipe	Water Level at Experimental Site: Reduced Level Peg	Water Level at Experimental Site: Diffce	Water Level at 1000 below Experimental Site: Readings on Pipe	Water Level at 1000 below Experimental Site: Readings on Peg	Water Level at 1000 below Experimental Site: Reduced Level Pipe	Water Level at 1000 below Experimental Site: Reduced Level Peg	Water Level at 1000 below Experimental Site: Diffce	Reduced Levels above Karáchí mean sea level
23-3	3	to 61	3 420	3 460	+	8	3 300	61 to 59	3·200	3 230	+ 030	..	..	..	..	..	
	3	„ 61	3 410	3 460	+	7	3·300	62 „ 60	3 200	3 240	+ 040	3 870	68 to 66	2 960	3 000	+ 010	875·80 throughout
	3	„ 63	3 450	3 485	+	0	4 310	67 „ 64	3 230	3 285	+ 055	3 950	72 „ 70	3 040	3 040	000	875 20 on 29 3 78
4 4	3	„ 66	3 460	3·515	+	0	4 310	67 „ 64	3 230	3 285	+ 055	3 940	73 „ 71	3 030	3 050	+ 020	874 92, from 4 4 8
8 4	3	„ 61	3 430	3 465	+	0	4 300	62 „ 60	3 220	3 240	+ 020	3 920	69 „ 67	3 010	3 010	000	875·09, throughout.
	4	„ 73	3 530	3 585	+	0	4 420	75 „ 74	3 340	3 375	+ 035	4 030	80 „ 78	3 120	3 120	000	872 85 throughout.
10 4	4	„ ·98	3 780	3 835	+	0	4 660	97 „ 96	3 580	3 595	+ 015	.	..	.	.	..	..
	4	„ 98	3 780	3 835	+	0	4 650	99 „ 98	3 570	3 600	+ 030	..	..	..	.	..	..
15-4	3	„ 36	3 180	3 215	+	4	4 060	39 „ 36	2 980	3 000	+ 025	3 630	44 „ ·42	2 720	2 760	+ 040	872·63 throughout
	3	„ 31	3 140	3 160	+	0	4 030	36 „ 32	2 950	2 970	+ 020	3 600	41 „ 39	2 690	2 730	+ 040	
16-4	3	„ 10	2 940	2 955	+	0	3 800	14 „ 11	2 720	2 755	+ 035	3 380	17 „ ·15	2 470	2 490	+ 020	872·33 till 16 4 78
	3 ..	„ 12	2 940	2 975	+	0	3 810	15 „ 12	2 730	2 765	+ 035	3 380	22 „ ·19	2 470	2 535	+ 065	873·27 from 23 4 78
23 4	4	„ ·96	3·780	3·815	+	0	4 670	99 „ 97	3 590	3 610	+ 020	4 325	10 „ 08	3 415	3 360	− 055	
	4	„ 95	3 760	3 805	+	0	4 660	98 „ 96	3 580	3 600	+ 020	4 330	08 „ 07	3 420	3 345	− 075	
24 4	4	„ 97	3 780	3 820	+	3	4 680	99 „ 97	3 600	3 610	+ 010	4 380	08 „ ·07	3 470	3 345	− ·125	
	4 ..	„ ·97	3 775	3 825	+	0	4 670	1 00 „ 98	3 590	3 620	+ 030	4·360	11 „ 09	3 450	3 370	− 080	
25 4	4	„ 95	3 760	3 800	+	0	4 670	98 „ 96	3 590	3 600	+ 010	4 250	09 „ 08	3 340	3 355	+ 015	Stand Pipe Indicators (Deduct 6 for length of Float-stick.) at 1000 above Experl Site
	4	„ 93	3 750	3 770	+	0	4 650	96 „ 94	3 570	3 580	+ 010	4 245	08 „ 06	3 335	3 340	+ 005	at Experimental Site
26-4	4	„ 91	3 750	3 760	+	0	4 640	94 „ 93	3 560	3 565	+ 005	4 370	05 „ ·03	3 460	3 320	− 140	at 1000' below Experl Site,
	4 .	„ 91	3 745	3 765	+	0	4 620	96 „ 94	3 540	3 580	+ 040	4 345	08 „ 06	3 435	3 310	− 095	at 1000 above Experl S te
1 5	4	„ 89	3 730	3 740	+	0	4 610	92 „ 90	3 530	3 510	+ 010	4 190	03 „ 01	3 280	3 290	+ 010	Tops of Pegs at Experimental Site,
	. .	..	..	..	..	0	4 600	90 „ 90	3 520	3 530	+ 010	..	..	.	..	..	..	at 1000' below Experl Site
23-5	.. ..	..	.	..	..	5	5 340	97 „ 96	3 700	3 710	+ 005	..	..	..	..	..	..	
	.. ..	..	..	..	..	3	5 360	99 „ 98	3 720	3 730	+ 005	..	..	..	..	..	..	
Range.	in 21 trials,		840	880	+	in 24 trials			1 005	975	050	in 18 trials,		1 000	880	200	
Means	„ „		3 539	3 575	+	„ „			3 177	3 401	+ 024	„ „		3 118	3 100	− 018	

No 6.—670' is omitted in the Reduced Levels n Table for shortness.

TABLE LXXVI.

EFFECT OF WIND ON WATER-LEVEL AT EDGES

Solání Embankment, Main Site.

* The readings of variable level, (viz, h h',) were made strictly simultaneously

Date	Expert No	Wind: Direction	Wind: Velocity	Depth on top immersed step: L. Edge. h	Depth on top immersed step: R. Edge. h'	Difference of Surface-Level at edges: L>R	Difference of Surface-Level at edges: R>L	General Data: Depth: Gauge.	General Data: Depth: Central	General Data: Surf Breadth	General Data: State of Canal.	General Data: Highest wet step: No	General Data: Highest wet step: Diffce of Level	Abbreviations	Diffce of Surface-Level at edges.
19-8 '78	1	W	17	34 to 28	46 to 45	035	..	7 29	about 8 47	161 7	Rising	8th on both Banks	180, (L > R)	L > R means Left higher than Right. R > L means Right higher than Left.	180 − (h' − h)
	2 3	..	.	34 „ 28	47 „ 44	035	..								
	4	..	..	35 „ 29	48 „ 44	040	..								
	5	..		35 „ 28	47 „ 46	030	..								
	6	W	18	33 „ 28	48 „ 46	015	..								
				36 „ 28	50 „ 4[illegible]	025	..								
Range,		..	.	03	·06	025	..								
Means,		W	18	..	..	·030									
30 5 '79	1	E	27	25 to 15	55 to 2	000	000	10 12	about 11 30	171 0	Falling?	4th on both Banks	200, (L > R)		200 − (h' − h)
	2	..	..	25 „ 12	49 „ 28	000	000								
	3	..	.	25 „ 12	51 „ 20		015								
	4	..	.	26 „ 10	48 „ 28	000	·000								
	5	..		25 „ 10	55 „ 2		035								
	6	.		29 „ 15	50 „ 23	055									
	7	..	.	24 „ 09	49 „ 26		·010								
	8	..		25 „ 05	52 „ 2		045								
	9	..	.	28 „ 11	54 „ 28	..	015								
	10	E	30	25 „ 05	55 „ 29	..	070								
Range		..		24	32	055	070								
Means,		E	29	..	..	..	·014								

TABLE LXXVII.

CONVEXITY OF WATER-SURFACE.

Solani Embankment, Main Site 19 5-'77.

The readings of variable levels, (viz h C' c' h C' c') were made strictly simultaneously

Each Reading-entry is the mean of three Readings.

For explanation of Symbols and Results, see Table LXXVIII

Expert No	Readings from Left Bank. H	h	C'	c'	Readings from Right Bank. H'	h'	C'	c'	Difference of Level of Water Surface. At Edges L>R	At Edges R>L	Elevation of centre above L. Edge	Elevation of centre above R. Edge	Elevation of centre above Mean of Edges.	General Data.
1 to 3	4 765	025	4·667	·089	4 809	219	4 547	08,	..	004	− 016	− 044	− ·030	Depth above datum = 9·23
4 „ 6	„	027	4 669	120	„	225	4 492	13,	.	008	+ 009	− 043	− 017	Central depth = 10 41
7 „ 9	4 ,60	034	4·619	109	4·850	228	4 506	098	.	004	− 002	+ 018	+ ·005	Surface breadth = 168 7
10 „ 12	„	·031	4 640	092	„	226	4 5 8	·082	.	005	− 003	+ 014	+ 006	Wind Calm throughout
Range,	005	009	038	031	041	009	055	053	..	004	025	062	·035	State of Canal Rising
Means,	..		.	..	..	.	..		..	·005	−·003	− ·014	− ·008	Number of top immersed step = 6th
														Diffce of Level of top immersed steps on either bank = 180 (L > R)

CONVEXITY OF WATER-SURFACE.

SOLÁNI EMBANKMENT, MAIN SITE 23-6 '77

[The readings of variable levels, (viz h C' c h'' C'' c'') of each line were made strictly simultaneously]

Expt. No.	Readings from Left Bank. H	h	C'	c'	Readings from Right Bank. H''	h''	C''	c''	Difference of Surface Levels at Edges R	Elevation of centre above L Edge	R Edge	Mean of Edges	General Data.	Results	Symbols.
1	H = 4·618 throughout	·075 to ·045	4·390 to 4·380	·195 to ·180	H'' = 4·725 throughout	·263 to ·245	4·300 to 4·290	·200 to ·150		− ·015	+ ·001	− ·007	Depth of water above datum = 9′ 93 to 10 07 Depth at Solání Gauge = 10′ 00 Central depth = about 11·20 Breadth of Water Surface = 171 0 Wind Calm throughout, Canal Ruling Central Surface Velocity = 4·43. Number of top immersed step = 4th on both banks Difference of Level of top immersed steps on either bank = ·196 L > R	Difference of surface level at edges = 196 − (h'' − h) Elevation of water surface at centre above either edge = ½ (H − h) − (C + c). [Elevation shown by +, Depression by − sign]	H = Reading of Levelling Staff on top immersed step h = Height of water surface above top immersed step C = Reading of Levelling Staff over centre of stream c = Reading of Construction strip of Levelling Staff at centre. [L > R means Left above Right. R > L means Right above Left.]
2		·070 „ ·050	4·390 „ 4·380	·190 „ ·180		·261 „ ·240	4·300 „ 4·290	·190 „ ·140		− ·012	+ ·014	+ ·001			
3		·060 „ ·040	4·400 „ 4·385	·190 „ ·175		·263 „ ·238	4·305 „ 4·295	·180 „ ·140		− ·007	+ ·014	+ ·004			
4		·085 „ ·040	4·390 „ 4·375	·180 „ ·170		·270 „ ·232	4·300 „ 4·285	·210 „ ·160		− ·002	− ·004	− ·003			
5		·090 „ ·050	4·420 „ 4·405	·150 „ ·140		·266 „ ·244	4·325 „ 4·315	·160 „ ·130		− ·010	+ ·005	− ·003			
6		·080 „ ·060	4·420 „ 4·410	·150 „ ·135		·270 „ ·242	4·325 „ 4·320	·150 „ ·120		− ·010	+ ·011	+ ·001			
7		·080 „ ·060	4·435 „ 4·420	·140 „ ·115		·276 „ ·250	4·350 „ 4·330	·140 „ ·090		− ·007	+ ·007	Nil.			
8		·080 „ ·050	4·440 „ 4·430	·130 „ ·110		·280 „ ·252	4·355 „ 4·340	·140 „ ·080		− ·002	+ ·001	− ·001			
9		·080 „ ·060	4·450 „ 4·435	·115 „ ·105		·275 „ ·254	4·360 „ 4·345	·150 „ ·090		− ·005	+ ·012	+ ·009			
10		·090 „ ·050	4·450 „ 4·440	·115 „ ·100		·273 „ ·252	4·360 „ 4·350	·140 „ ·070		− ·005	+ ·002	+ ·002			
11		·080 „ ·050	4·445 „ 4·435	·115 „ ·100		·280 „ ·256	4·365 „ 4·350	·140 „ ·080		+ ·010	− ·011	− ·001			
12		·090 „ ·050	4·550 „ 4·555	·095 „ ·085		·255 „ ·280	4·370 „ 4·365	·120 „ ·070		− ·095	− ·005	− ·050			
13	H = 4·615 throughout	·095 to ·055	4·285 to 4·280	·270 to ·250	H'' = 4·727 throughout	·320 to ·280	4·200 to 4·190	·280 to ·265		− ·003	− ·041	− ·022			
14		·098 „ ·070	4·290 „ 4·285	·260 „ ·240		·310 „ ·290	4·205 „ 4·195	·265 „ ·255		− ·002	− ·033	− ·018			
15		·100 „ ·063	4·295 „ 4·290	·265 „ ·250		·280 „ ·260	4·205 „ 4·195	·280 „ ·255		+ ·018	− ·011	− ·015			
16		·100 „ ·061	4·315 „ 4·300	·220 „ ·210		·290 „ ·270	4·225 „ 4·210	·260 „ ·230		+ ·011	− ·016	− ·003			
17		·080 „ ·064	4·320 „ 4·305	·240 „ ·220		·290 „ ·255	4·300 „ 4·150	·260 „ ·235		Nil	− ·018	− ·009			
18		·100 „ ·056	4·320 „ 4·310	·230 „ ·220		·280 „ ·265	4·250 „ 4·150	·255 „ ·240		− ·003	+ ·007	+ ·002			
19		·100 „ ·057	4·305 „ 4·290	·230 „ ·215		·280 „ ·270	4·210 „ 4·200	·255 „ ·235		+ ·016	+ ·002	− ·009			
20		·096 „ ·062	4·315 „ 4·305	·245 „ ·215		·283 „ ·265	4·223 „ 4·210	·260 „ ·245		− ·004	− ·018	+ ·011			
21		·115 „ ·055	4·320 „ 4·310	·225 „ ·210		·290 „ ·260	4·225 „ 4·220	·260 „ ·230		+ ·003	− ·016	− ·010			
22		·096 „ ·056	4·330 „ 4·320	·215 „ ·200		·280 „ ·260	4·235 „ 4·230	·265 „ ·220		+ ·006	− ·018	− ·006			
23		·100 „ ·060	4·315 „ 4·325	·215 „ ·205		·280 „ ·260	4·240 „ 4·230	·255 „ ·215		− ·003	− ·013	− ·008			
24		·110 „ ·068	4·335 „ 4·325	·225 „ ·210		·280 „ ·260	4·240 „ 4·235	·240 „ ·215		− ·022	− ·008	− ·015			
Ranges,		.. ..	.. ..	.. ..		.. ..	.. ..	.. ..		− ·002	− ·015	− ·009			
Means,		.. ..	.. ..	.. ..		.. ..	.. ..	.. ..		− ·009	− ·007	− ·006			

TABLE LXXIX.

SURFACE SLOPE MEASUREMENTS IN 2000 AND 4000 SLOPE LENGTHS

The two water-level determinations concerned in each (individual) Surface-Slope Measurement were *strictly simultaneous*. Those required for the 4000′ Slope-Length were taken about 5 minutes after those of the 2000′ Slope-Length (and by the same Observers).

Site	Solani Right Aqueduct Site, Right Bank.											Embankment
Date, 1876.	2–6	3–6	5–6	14–6	17–6	18–7	19–7	20 7	21–7	22–7	24–	8–9
Wind,	V l	C	C	V l	ENE l	C	C	C	C	C	C	C
Gauge at Experimental Site,	9 54	9 62	10 00	9 96	9 98	7 06	6 87	6 65	7-05	4 30	6 25	7 47
Surface-Fall (in feet) from 2000 to 1000 above Site,	·15	16	18	18	19	12	10	12	11	08	10	25
Surface-Fall (in feet) in 1000 above Site,	24	24	19	22	20	23	24	24	24	28	35	20
Surface-Fall (in feet) in 1000 below Site	15	13	18	16	19	25	22	22	22	38	19	22
Surface-Fall (in feet) from 1000′ to 2000 below Site	11	13	13	·14	·14	10	11	11	13	07	12	23
Surface Slope, in 2000	195	185	185	190	195	240	230	230	230	330	270	210
Surface Slope, in 4000,	163	165	170	175	180	175	168	173	175	203	240	220

Solani Embankment, Main Site, Left Bank

SURFACE SLOPE-MEASUREMENTS ON BOTH BANKS TABLE LXXX.

The two water-level determinations concerned in each (individual) Surface-Slope Measurement were *strictly simultaneous*. Those of the Right Bank were made from 2 to 3 hours after those on Left Bank at same Station (and by the same Observers). The Sub-Column Variation shows the Variation of Gauge-Reading in the interval (occupied by Discharge-Measurement). The Reference Nos. refer to Abstract Tables 29, 30.

Reference No.	Date 1876	Solani Embankment Main Site								Solani Twin Aqueducts							
		Depth		Wind				Surface Slope		Depth		Wind				Surface Slope	
				From		To						From		To			
		Gauge Reading.	Variation	Dirn	Vely	Dirn.	Vely	Left Bank	Right Bank	Gauge Reading	Variation	Dirn	Vely	Dirn.	Vely	Left Bank	Right Bank
7	18 12 78	9 88	− 01	S	5	E	7	220	228	.	..	..	.	..	.	..	..
17	14 12- „	.	..	..	.	.	.	..		9-99	− 03	NE	4	?	?	183	175
18	19-12 „	9 91	+ 04	E	4	E b S	8	228	225	87	− 03	SE	l	NE	l	190	200
19	20-12-„	88	− 01	S	3	W	10	228	238	83	− 02	..	0	SW	12	195	205
20	15-4 79	43	+ 15	W	9	W	25	265	218	40	+ 09	NW	l	SW	12	215	200
21	12-4 78	47	00	E	8	E	8	205	228	46	+ 16	SE b S	7	E	23	198	190
22	28-5- „	50	− 01	W	7	W	9	243	235	45	− 06	W	6	V	l	205	188
23	27-5 „	45	− 01	V	l	V	g	220	235	39	− 02	SW b W	8	SW	13	210	190
24	6 4-„	8 75	00	W	6	W	6	215	233	8-67	00	NW	2	NW	3	275	193
25	20-3 „	03	− 21	SW	l	WSW	l	199	230	48	− 25	SW	l	WSW	l	218	198
26	21 3 „	24	00	SE	3	V	l	204	239	18	− 03	SE	3	V	l	290	228
27	12-3-„	05	00	SE	6	SE	8	200	224	7 99	− 02	SE	6	SE	8	210	195
28	9-3 „	7 63	− 02	..	0	..	0	214	205	50	00	..	0	..	0	220	203
29	8 3 „	61	− 01	W	10	V	l	211	241	02	− 04	SW	9	NW	l	223	205
30	11 3 „	60	− 01	.	0	..	0	218	233	51	− 01	.	0	.	0	235	205
31	7 3-„	61	00	S b W	6	W	7	213	238	50	00	S	6	S	7	203	213

N B—For numerous other Non-simultaneous Surface-Slope Measurements on opposite Banks, (at Fifteenth Mile, Beira, Jacli, and Kambera Sites) see Detailed Tables XLIX–LV

SURFACE SLOPE-MEASUREMENTS ON BOTH BANKS TABLE LXXXI.

Date.	Gauge	Wind	Surface Slope		Solani Embankment Main Site
			L Bank	R. Bank	Remarks
8-12 76	9 07	Calm	203	213	
9 12-„	9 77	Calm.	138	155	

SIMULTANEOUS LOCAL SURFACE-SLOPE MEASUREMENTS.

At Fifteenth Mile, and Solani Sites

[The Slope-measurements on same bank were executed at each of the 3 Sites strictly simultaneously.]

The "Variation of Gauge" entry shows the variation during 2 or 3 hours' Field work (Discharge-Measurement) done in connection with these Slope-Measurements.

Reference No.	Date, 1878	Fifteenth Mile Site. Gauge Reading ft.	Fifteenth Mile Site. Variation of Gauge	Fifteenth Mile Site. Wind Direction	Fifteenth Mile Site. Wind Velocity	Solani Embankment Main Site. Gauge Reading ft.	Solani Embankment Main Site. Variation of Gauge	Solani Embankment Main Site. Wind Direction	Solani Embankment Main Site. Wind Velocity	Solani Aqueduct Sites. Gauge Reading ft.	Solani Aqueduct Sites. Variation of Gauge	Solani Aqueduct Sites. Wind Direction.	Solani Aqueduct Sites. Wind Velocity	Surface-Slope (S) (Simultaneous). Fifteenth Mile.	Solani Embankment.	Solani Twin Aqueducts.	Bank.
1	18-12	15 21	− 03	W	3	9 90	− 01	S	5	?	..	..	.	215	225	?	L
2	19 12	16	+ 01	..	0	89	+ 04	E	4	9·88	− 01	SE	1	213	228	190	L
3	20 12	?	..	..	.	88	− 01	S	3	83	00	..	0	?	228	195	L
4	23- 5	15 30	+ 02	NW	1	10 06	− 07	W	8	No Field work	..	..	.	240	213	Observations.	L
5	10 4	14-33	− 01	..	0	9 10	+ 02	V	1		..	..	.	253	215		L
6	8- 4	13 97	− 12	..	0	8·79	+ 05	V	1		..	..	.	228	215		L
7	4- 4	98	00	..	0	79	+ 01	W	0		..	..	.	223	217		L
8	29 3	95	00	N	8	74	− 02	W	20		..	..	.	230	205	No	L
9	14-12		..	..	.	10·01	− 05	E	7	9 93	− 03	NE	4		230	18	L
10	12- 4		..	..	.	9 47	00	E	8	·35	+ 16	SE½S	7		205	198	L
11	„		..	..	.	·47	„	E	8	51	„	E	2		228	190	R
12	28- 5		..	..		50	− 01	W	7	48	− 06	W	0		243	205	L
13	„		..	..	.	49	„	W	9	42	„	V	1		235	188	R
14	27- 5		..	..	.	45	− 01	V	1	40	− 02	SW½W	8		220	210	L
15	„		..	..	.	44	„	V	9	·38	„	SW	17		233	190	R
16	6- 4		..	..	.	8 75	00	W	0	8 67	00	NW	2		215	225	L
17	„		..	..	.	75	„	W	0	·67	„	NW	3		233	193	R
18	20- 3		..	..	.	63	− 21	SW	1	60	− 25	SW	1		199	218	L
19	„		..	..	.	·42	„	WSW	1	·35	„	WSW	1		230	198	R
20	21- 3		..	..	.	24	00	SE	3	19	− 03	SE	3		204	220	L
21	„		..	..	.	24	„	V	1	16	„	V	1		231	228	R
22	12- 3		..	..	..	05	00	SE	0	·00	− 02	SE	0		200	210	L
23	„		..	..	.	05	„	SE	8	7 98	„	SE	8		227	195	R
24	9- 3		..	..	.	7 64	− 02	..	0	58	00	..	0		214	220	L
25	„		..	..	.	62	„	..	0	·58	„	..	0		205	203	R
26	8- 3		..	..	.	61	− 01	W	10	·54	− 04	SW	4		211	223	L
27	„		..	..	.	60	„	V	1	·50	„	NW	1		241	205	R
28	11- 3		..	..	.	60	− 01	..	0	·51	− 01	..	0		218	235	L
29	„		..	..	.	59	„	..	0	50	„	..	0		233	205	R
30	7- 3		..	..	.	61	00	S½W	0	50	00	S	0		213	225	L
31	„		..	..	.	·61	„	W	7	50	„	S	7		238	213	R

No Field-work at this Site on these days.

TABLES LXXXIII.—LXXXVI.

Silt and Evaporation

Table LXXXIII. shows two Sets (Series 261, 262) of Silt-Densities on 9 verticals at the Solani Right Aqueduct and Embankment Main Sites The Table is got up in pattern similar to those of Mean Velocity, (*see* explanation at page 67). No Velocity-work having been done along with the Silt-collections, the "Mean Results" of Mean Velocity Series Nos 111, 153, 154 have been brought forward for comparison of Mean Velocity with Silt Density on same vertical, and for computation of Silt-Velocities (s) and Silt Discharges (S)

Tables LXXXIV, LXXXV show the details of Silt Collections made on centre vertical and of those on various verticals forming Series 261, 262 above, with the Silt-Densities and Silt-Discharges corresponding Except in Series 261, 262 the Silt-Discharges (S) are only roughly approximate, being merely the products of the Central Silt-Densities (σ_0) by the Cubic Discharges.

No velocity-work was done along with the Silt-Collections of Table LXXXIV. so that the Cubic Discharges quoted are only interpolations from Tables XXXIV. to XL. The Silt-Collections of Table LXXXV were made either before or after the velocity work of Tables L., LI, so that the Cubic Discharges quoted are actual measurements.

The Quantity of water collected, and the Quantity *expected* (computed from the depth of water, H) are shown for every Silt-collection in Table LXXXIV The Difference (or "Loss') shows roughly the difficulty of handling the Silt-Tube, (some "Loss' being of course allowed for the spring bottom shutting before the Tube touched the Bed) On the rough bed of the Solâní Embankment the 'Quantity expected" is somewhat conjectural, being computed from the Average Depths, whilst the Silt-Tube was liable to close on touching any roughness on the Bed.

[In the above Tables the Silt-Density (σ) means the Density of aggregation of the Silt in the water, and is formed as the quotient—

Quantity of Silt collected — quantity of water in which it was contained,

and is measured in grains per cubic foot]

Table LXXXVI. shows the quantity (depth in inches) of Evaporation from the Canal Surface from 1876 to 1879 at the Solâní Aqueduct, and from January to March 1879 at the Kamhera Site Various meteorological data affecting evaporation, (such as Mean Temperature, Mean Humidity, Average Wind,) are given for the Solani Experiments

SILT-DENSITIES, -VELOCITIES AND -DISCHARGES.

No. 261 at Solani Right Aqueduct; No. 262 at Solani Embankment, Main Site.

[*Instrument*—12′ × 2″ × 2″ *Silt-Tube*].

No velocity-work was done along with these Silt-collections. The 'Mean Results' of Mean Velocity Series Nos. 111, 153, 154 have been brought forward for computation of Silt-Velocities and -Discharges.

Solani Sites.	Serial No.	1 Date, 1877.	2 Depth. Above Datum. A	Depth. Central H	Depth. Solani Aqueduct Gauge.	Depth. Hyd. Mean. R	Surface Breadth. b	Area. A	6 Mean Velocities (u), Silt Densities (σ), and Silt Velocities (s), past each vertical [V B —σ is measured in grains per cubic foot, and s in grains per second]. Description of line	Left of centre. 42½	40	30	20	10	Centre	Right of centre. 10	20	30	39½	42½	7 Cubic and Silt Discharge in c. ft., and lbs per sec D, S	8 Mean Velocity, Mean Silt Density, Mean Silt Velocity. V, σ̄, s̄
Right Aqueduct.	111	16 Sets	8 97	8 97	8 97	7 42	83 7	760 1	Rod-Velocities, (u),	?0	3 65	4·02	4 00	4 04	4 03	4 05	3 99	3 94	?3 43	?0	c. ft. 2,956	V = 3 88
	261	22-6-77	9·00	9 00	9 00	7 44	83 0	762 6	Silt-Densities, (σ)	?	98 9	82 8	99 9	85 4	?40 4	94 7	99 9	87·7	87 8	?	.. lbs	σ̄ = 86·3
									Silt-Velocities, (s),	?0	361	333	400	345	?163	384	399	346	?301	?0	30 6	s̄ = 335

Main Site.		Date.	A	H		R	b	A	Description of line.	Left of centre. Edge	74½	60	40	20	Centre	Right of centre. 20	40	60	74½	Edge	D, S	V, σ̄, s̄
	154	6 Sets	9·30	10 46	9 21	8 82	167 9	1651·1	Rod Velocities, (u),	?0	2·78	3 54	3 81	3 92	3 87	3 93	3·94	3 58	2 84	?0	c. ft. 6,049	V = 3·66
	153	5 Sets																				
	262	19-7-77	9 26	10·44	9 10	8 73	168 7	1644 3	Silt-Densities, (σ).	?	359	378	349	347	376	436	383	354	324	?	.. lbs	σ̄ = 370
									Silt-Velocities, (s),	?0	998	1,338	1,330	1,360	1,455	1,713	1,509	1,267	920	?0	317 6	s̄ = 1,352

TABLE LXXXIV.

SILT-DENSITIES AND -DISCHARGES.

At Solání Twin Aqueduct and Embankment Main Sites.

[*Instrument*—12′ *Silt-Tube, 2″ diam*]

The Silt Discharges (S) Nos. 1 to 24 are only rough approximations, *see* Explanation, page 152.

Sites	Reference No	Date, 1876 7 8	Position of vertical.	Depth at Gauge h	Depth on vertical of Experiment H	Quantity of water in Tube: corresponding to depth c in	Quantity of water in Tube: actually collected c, in	Quantity of water in Tube: Loss c in	Silt: Actual [in grains.]	Silt: Density [lbs. per c. ft.] σ_s	Cubic Discharge Approximate D	Silt Discharge [Approx. in lbs. per sec.] S	Mean Velocity. V
Solani Left Aqueduct	1	16 12-'76	Central.	10 00	10 00	754 3	588 7	165 6	6 6	19 4	3,497	9 7	4 14
	2	21-12- „		00	00	754 3	650 7	103 6	15 7	41 8	3,497	20 9	4 14
	3	6-1-'77		9 60	9 60	724 1	675 2	48 9	22 9	58 8	3,218	27 0	3 96
	4	24 2- „		8 05	8·05	607 2	567 1	40 1	10 2	31 3	2,373	10 6	3 48
	5	8 3- „		30	30	313 0	285 1	27 9	1 5	9 4	2,473	3 3	3 51
	6	17-3- „		10	10	305 5	245 7	59 8	4 3	30 5	2 393	10 4	3 48
	7	9-5- „		75	7·5	330 0	305 9	24 1	6 5	36 8	2,653	13 9	3 58
Solani Right Aqueduct	8	17-4-'77	Central.	8 59	8 59	324 0	308 3	15 5	2 5	13·0	2,722	5 4	3 73
	9	28 4- „		9 48	9·48	357 5	346 6	10 9	4 9	24 7	3,140	11 1	3·91
	10	15 5- „		·63	63	363 2	344 9	18 3	5 2	26 4	3 240	12 2	3 98
	11	22 5- „		62	62	362 8	351 8	11 0	5 2	25 (	3,235	12 0	3 97
	12	30-5- „		10 00	10 00	377 1	362 6	14 5	6 7	31	3,401	15 5	4 02
	13	22 6- „		9 00	9 00	339 4	318 0	21 4	7 4	40 4	2,949	17 0	3 87
	14	22 8 „		68	68	365 1	350 9	14 2	56 8	280 4	3,262	130 5	3 98
	15	15-9- „		10 00	10 00	377 1	358 7	18 4	35 0	169 1	3,401	82 1	4 02
	16	22 9- „		10 00	10 00	377 1	360 5	16 6	24 3	117 0	3,401	56 9	4 02
	17	29 9- „		02	02	377 9	368 3	9 6	23 5	110 8	3,410	54 1	4 03
	18	6 10- „		00	00	377 1	352 7	24 4	13 4	65)	3 401	32 0	4 02
	19	13 10- „		5 82	5 82	219 5	218 4	1 1	5 4	42 7	1,624	9 9	3 29
	20	20 10- „		3 80	3 80	143 3	129 5	13 8	4	5 1	842	6	2 62
	21	27-10 „		4 60	4 60	173 5	159 4	14 1	2	3	1 162	0	2 98
	22	13-11- „		8 97	8 97	338 3	323 2	15 1	7 1	38 1	2,941	16 0	3 86
	23	15 12- „		6 50	6 50	245 1	231 4	13 7	4 5	33 ?	2 010	9 7	3 65
	24	16 1-'78		68	68	251 9	222 3	29 6	52 1	404 7	2,041	118 3	3 59
	25	22 6-'77	40 L	9 00	9 00	339 4	299 8	39 6	17 1	98 9			
	26	„ „	30 L	„	„	„	315 4	24 0	15 1	82 8			
	27	„ „	20 L	„	„	„	313 7	25 7	18 1	99 3			
	28	„ „	10 L	„	„	„	324 9	14 5	16 0	85 4			
	29	„ „	C	„	„	„	318 0	21 4	17 4	40 4	>2,956	36 6	3 88
	30	„ „	10 R	„	„	„	324 9	14 5	17 8	94 7			
	31	„ „	20 R	„	„	„	322 3	17 1	18 6	99 (			
	32	„ „	30 R	„	„	„	324 9	14 5	16 4	87 7			
	33	„ „	40 R	„	„	„	324 5	14 9	16 4	87 8			
Solani Embankment Main Site	34	19-7-'77	75 L	9 26	9 64	?363 6	351 8	?11 8	7 2 8	359			
	35	„ „	60 L	„	10 20	?384 7	375 2	?9 5	8 1 8	378			
	36	„ „	40 L	„	68	?402 8	417 7	+ ?14 9	8 4 2	349			
	37	„ „	20 L	„	64	?401 3	392 5	?8 8	7 8 6	347			
	38	„ „	C	„	44	?393 7	367 4	?26 3	7 9 8	376	>6,049	317 6	3 66
	39	„ „	20 R	„	11 00	?414 9	373 5	?41 4	9 4 0	436			
	40	„ „	40 R	„	21	?422 8	376 1	?46 7	8 3 1	383			
	41	„ „	60 R	„	10 90	?411 1	382 0	?28 1	7 8 3	354			
	42	„ „	75 R	„	9 92	?373 1	357 9	?15 2	6 6 9	324			

TABLE LXXXV.

SILT-DENSITIES AND -DISCHARGES.

BELBA SITE.

[Instrument—12′ Silt-Tube, 2″ diameter]

These Silt-Collections were made just before or after the velocity work detailed in Tables L, LI.

The Silt-Discharge (S) is simply the product σ_o D (reduced to lbs. per sec.)

Serial No	Date 1879	Depth at Gauge h	Depth Central H	Water collected c. in.	Silt Actual (in grains.)	Silt Density (in grs. per c. ft.) σ_o	Cubic Discharge (in cub. ft. per sec.) D	Silt Discharge (Approximate in lbs. per sec.) S	Mean Velocity V
201	27-3	7 54	9 89	329 3	16 4	86	5 439		
	9-1	50	63	318 4	13 0	71	5 751		
	11 1	44	57	353 5	19 1	93	5 765		
	17 3	2.)	48	342 3	201 8	1,025	5 367		
Range,		25	41	35 1	188 8	954	384		
Means of 4,		7 44	9 64	335 9	62 6	319	5,579		
					20	27	36 4	178 9	948	558	687 0	29
					Means of 5	6 80	9 09	316 5	81 2	436	5,112	311 8	3-09
					7 2	6 37	8 63	337 9	47 1	241	4,791	164 8	3-05
	23 1	98	64	328 0	24 3	123	5 425	100-0	3 19				
	„	94	60	„	„	„	5,301	97 7	3 13				
205					30 1	33	65	238 7	9 1	66	4 745	44 7	3 06
					8 2	32	58	293 9	16-4	96	4 826	66 1	3 09
					4-2	28	54	243 1	79 1	561	4 791	383-7	3-08
					10 2	27	51	330 1	20 6	108	4 724	72 9	3 05
					31 1	21	53	297 6	23 8	139	4,718	93 7	3-08
Range,		26	48	57 2	504 5	2,918	282	2265 5	19				
Means of 7		7 03	9 49	322 3	106 4	600	5 329	463 5	3 12				
					16	14	99 2	70 0	495	108	339 0	04
						8 57	290 6	32 7	202	4,766	137 7	3 07
						8 28	308 5	16 7	99 4	582	64 8	1 04
204.						15	274 7	12 8	81	4,121	47 7	2 79
						06	275 6	15 8	99	4 481	63 4	3-06
						11	284 2	20-9	127	4,361	79-1	2-97
					7 98	282-9	7 7	48	4 166	28-6	2 89
					98	291 1	28 7	171	4,248	103 8	2-94
					97	305 4	21 5	123	4 064	71 5	2 82
					15 2	72	96	270-8	34 3	219	4,160	130 1	2-88
Range,		26	30	64 1	199 7	1,203	223	849 1	20				
Means of 12		6 43	8 71	305 1	51 4	301	4,810	211-0	3 01				
					30	32	46 4	379 8	5,185	518	3179 2	27
					Means of 13.	5-84	8-10	287-5	100 5	601	4,292	369 5	2 92

TABLE LXXXVI.

EVAPORATION FROM GANGES CANAL

ROORKEE AND KAMHERA REACHES

[*Instrument*—12″ × 12″ *Evapometer*]

[Time is reckoned from midnight right through the 24 hours.]

† The Thomason C. E. College is about one mile from the Solani Aqueduct Site.

SITES.	Experiment No	DURATION OF EXPERIMENT: From Date, 1876 79	From Hour	To Date 1876 79.	To Hour	Total in days.	AT THOMASON C. E COLLEGE † ROORKEE. Mean Temperature Fahr	Mean Humidity Saturation = 100	WIND: Prevailing Direction (Approximate).	WIND: Total (in miles p r day)	AT THE EXPERIMENTAL SITE. Temperature of water: Initial Fahr	Temperature of water: Maximum Fahr	Rainfall [affecting the Expert] Inch.	EVAPORATION (corrected for rain): Total Inch	EVAPORATION (corrected for rain): Mean per day. Inch.
SOLANI AQUEDUCT At Tail of Central Pier	1	28-11 76	8-30	7 12 76	8-30	9 0	56 9	57 0	W	58 5	Not observed	Not observed	None	1 26	14
	2	7 12- „	8 45	14-12- „	10·0	7 1	57 0	54 5	NW	35 7				72	10
	3	14-12 „	10 15	21 12 „	12 15	7 1	55 2	61 0	SE	33 6				65	09
		Pan broke away and lost.					.	..	.	..				..	..
	4	24 2 77	10·0	3-3-77	11·0	7 0	62 8	49 0	NW	84 0				96	14
	5	3 3 „	11 0	10-3- „	10 20	7 0	68 8	44 0	SE	50 8				43	·06
	6	21 3 „	6 5	29 3- „	9·45	8 2	63 6	46 5	NW	54 8				97	12
	7	15 5 „	7 30	22 5- „	7 30	7 0	85 9	25 0	NW	73 1				1 02	15
	8	19 6 „	5 15	26 6 „	7 30	7 1	94 9	23 5	NW	84 3		65°		84	12
		Rainy Season													
	9	13 10-77	8 10	20 10 77	7 15	7 0	78 3	41 5	S	48 4				1 02	15
	10	2 11- „	9 30	12 11- ,	9 30	10 0	71 5	41 0	SE	35 8				1 27	13
	11	12 11 „	9 40	21 11 „	10 0	9·0	69 9	41 5	SE	34 5				1 20	13
	12	26-11 „	1 0	7 12 „	9·30	10·	61 7	52 5	NW	50 1				1 20	11
	13	19 12-	3·0	28 12 „	12 0	9 0	61 3	79 5	NW	60 8				+ 06	+ ·01
	14	14 1 78	12 0	24 1 78	15 0	10	56 4	68 0	NW	35 0				48	05
	15	28 1- „	10 0	2 2 „	14 0	5 2	54 1	70 5	NW	52 1				38	07
	16	5 3- ,	8 30	12-3 „	9 30	7 0	65 7	37 5	NW	60 8				1 20	11
	17	20-3- „	9 30	26 3- „	8 30	6·0	75 3	36 5	NW	31 6				80	13
	18	26 3 „	8 40	2 4 „	8 15	7 0	80 5	27 5	NW	85 3				94	13
	19	5-4- „	7 30	11-4 „	7 0	6 0	79 9	20 0	SE	42 9				1 72	29
	20	15 4 „	8 0	25-4 „	7 0	10·0	79 4	39 5	SE	40 1	62½°	?	005	1 27	13
	21	6-6- „	7·0	17 6- „	6 15	11·0	95 8	18 5	NW	94 2	67°	75½°	None.	1 32	12
		Rainy Season					.	..	.	.	..	..	..	..	.
	22	22 10-78	7 15	4-11 78	10 30	13 1	65 8	39 5	NW	46 1	63°	66°	None	64	·05
	23	4-11- „	10 30	20 11 „	12 0	16·1	65 8	34 5	NW	46 1	61°	64°		2 50	16
	24	22 11- ,	12 0	29-11 ,	12 30	7 0	63 4	45 5	SE	28 6	56½°	62°		45	06
	25	29-11 „	12 30	3 12-„	12 12	4 0	66 5	52 0	SE	58 9	57°	?	23	45	11
	26	3-12 „	13 30	14-12 „	15 0	11 1	60 8	50 5	NW	38 8	?	?		98	·09
	27	14 12 ,	15 10	25 12 „	13·0	10·9	55 2	40 5	SE	38 2	?	?		1 12	10
	28	10-4 79	7·0	28-4 79	7 0	18·0	84 5	13 5	NW	62 5	?	?	None	2 95	16
KAMHERA SITE About 50 below Expert Site	29	6-1 79	16·0	13 1 79	13·0	6·9	No Meteorological Observatory near this Site, which is 33 miles from Roorkee, *see* Plate III.				Not observed	Not observed	Evapometer placed under shelter during rain	45	07
	30	13 1- „	13 0	18-1- „	14 0	5·0								57	11
	31	18-1 „	14 0	25 1 ,	10 20	6·8								1·07	15
	32	25-1 ,	10·30	4-2 „	15 0	10·2								1 95	19
	33	4 2-„	15 0	11 2 „	15 0	7·0								1 25	18
	34	11 2 „	15·0	15 2 „	16·0	4·0								85	21
	35	15 2-„	16 0	25 2 „	15 0	10·0								35	04
	36	25-2 „	15·0	4-3 „	12 0	6·9								1 45	21
	37	4-3- „	12·0	11-3- „	12·0	7·0								1 60	23
	38	11-3- „	12·0	18-3 „	11 0	7·0								·60	09
	39	18 3-„	11·0	25-3- „	12 0	7·0								2 60	37
	40	25-3- „	11 30	27 3- „	11 30	2 0								45	23

PART II.

ABSTRACT TABLES.

TABLES 1–34.

PART II.—ABSTRACT TABLES.

Tables 1—34.

These Tables contain an Abstract of the principal Results (chiefly "Means" and "Ranges") from the Detailed Tables (VII.—LXX.) preceding, together with additional Results (mostly computed, not experimental details). They bear separate numbering in black letter Arabic numerals (1—34), and separate pagination A Table of Contents follows.

Reference to these Abstract Tables will be sufficient for most purposes, and so save reference to the Detailed Tables

ABSTRACT TABLES,—CONTENTS.

EFFECT OF CONTROL ON SURFACE-FALL

This Table is an Abstract of the Results required for Plates VIII IX, together with additional data.

SITES.		Serial No	Number of Sets	CONTROL. Head of Reach: Gates open in Dam	Head of Reach: Ogees open in Dam	Head of Reach: Gates closed in Regulator	Tail of Reach: Withdrawn by Distributaries Q	Tail of Reach: Average Obstruction k	GAUGE-READINGS. Head Gauge of Reach.	Experimental Sites: 16th Mile	Experimental Sites: Embankment, Main Site	Experimental Sites: Solani Aqueduct.	Experimental Sites: Jaoli Site	Tail Gauge of Reach	SURFACE-FALL. Sub-Reaches: Upper Sub-Reach F_1	Sub-Reaches: Middle Sub-Reach F_2	Sub-Reaches: Lower Sub-Reach F_3	Whole Reach. F	Surface Slope S	[Bank]
SOLANI AQUEDUCTS	Left	106	6	0	1/4	0	23	00	7 30	Not observed.		8 02		3 55	5 88	No middle Sub Reach	4 27	10 10	?206	Left
	Right [Left Aqueduct open]	112	18	0	0	0	116	00	7 82		Not observed	8 58	Not observed	3 67	5 80		4·71	10·56	?	Right
		113	1	0	0	0	0	00	7 40			8 16		3 60	5 84		4 36	10 20	228	
		116	7	0	0	0	41	13	6 84			7 49		3 51	5 90		3 79	9 74	?207	
		120	9	0	0	0	144	1 04	5 07			5 78		3 38	5 89		2 20	8·09	?	
		125	1	3	0	10	0	00	5 20			2 02		1 40	7 78		42	8 20	203	
		127	1	16	0	10	0	50	1 50			70		7 50	7 40		7 00	?7 40	113	
	Right [Aq closed]	131	2	0	0	0	247	?4 30	1 60			4 60		4 30	3 60		10	3 70	025	Right
		133	1	0	0	0	162	3 08	1 35			3 60		3 40	4 30		00	4 30	?	
		136	1	0	0	8	71	1 33	2 80			3 12		2 30	6 28		62	6 90	208	
		139	2	0	0	8	50	1 24	2 00			2 66		2 30	5 95		16	6 11	151	
SOLANI EMBANKMENT, MAIN SITE	High Water	22	16	1/16	0	0	24	33	5 97		6 76	6 55		3 30	4 64	1 38	3 05	9·07	?	
		151	5	0	0	0	268	00	9 21	Not observed	9·94	9 87	Not observed	4 21	4 70	1 25	5 46	11 41	227	Left
		154	5	0	0	0	243	00	8 36		9 08	8 94		3 91	4 71	1 39	4 83	10 86	?229	
		155	6	0	0	0	104	00	8 03		8 74	8 65		3 81	4 72	1 26	4 65	10 63	217	
		160	6	0	0	0	18	00	6 29		7·06	6 91		3 20	4·67	1 32	3 52	9 51	214	
		161	11	0	0	0	16	00	6 07		6 82	6 72		3 13	4 68	1 27	3 39	9 34	?217	
		164	1	0	0	0	0	6	5 10		5 24	?4 69		2 00	5 29	1 72	2 49	9 50	?	
	Low Water	168	1	0	0	0	147	2 67	3 09		3 98	4 50		3 70	4 45	65	60	5 70	?	Left.
		171	3	0	0	0	258	?4 30	1 83		3 62	4 55		4 30	3 65	24	·05	3 94	?038	
		172	2	0	0	0	246	?4 30	1 55		3 58	4 55		4 30	3 41	20	03	3 66	?	
		173	5	0	0	8	232	2 08	2 33		3 47	4 23		3 95	4 29	41	·09	4 79	088	
		176	2	4½	0	8	104	1 76	2 43		2 83	3 30		2 80	5 03	70	30	6·03	?242	
		178	2	0	0	0	82	2 64	1 35		2 43	3 28		2 99	4 36	32	18	4 86	?	
		180	3	0	0	9	19	1 24	1 80		1 67	2 50		2 00	5 72	39	10	6 21	148	
		181	1	13	0	10	0	67	2 50		35	93		? 67	7·58	59	?·06	?8 23	090	
15TH MILE	Old Site	191	1	0	0	0	123	00	9 30	15 31	Not observed	9 99	Not observed	4 26	2 28	3·63	5 54	11 45	240	Left
		192	6	0	0	0	44	00	8 29	14 32		8 98		3 92	2 26	3 65	4 87	10 78	231	
		193	3	0	0	0	80	00	8 00	13 99		8 70		3 7	2 30	3·60	4 73	10 63	227	
		194	2	0	0	0	0	00	7 58	13 60		8 25		3 65	2 27	3 66	4 40	10 33	231	
		195	1	0	0	0	62	00	6 30	12 53		7·05		3 20	2·06	3 70	3·65	9·50	?	
	New Site	196	3	0	0	0	268	00	9 13	15 16		9 83		4 20	2 26	3 65	5 37	11 28	?291	Both
		197	1	0	0	?	115	00	8 60	14 69		9 35		3 95	2 19	3 66	5 20	11·05	220	
JAOLI.		211	2	No Dam in this Reach		No Bays closed	53	? 00	6 35	Not required.	Not required	6·21	?3 35	·39	No middle Sub Reach		?·49	5 88	?174	Both
		212	6				43	00	5 79			5·71	3 32	39			5 14	5·46	160	
		213	7				52	29	5 50			5·45	3 30	29			4 80	5·09	?148	
		214	7				35	00	5 25			6 21	3 16	28			4 70	4 98	146	
		215	10				47	20	4 98			5·97	3 09	25			4 53	4·78	145	
		216	9				44	44	4 67			5·64	3 89	27			4 19	4·46	144	
		217	6				16	67	4 33			5 56	3 21	21			3·76	3·97	140	

DOUBLE-FLOATS OF

EXPERIMENTS	Reference to original	DOUBLE FLOAT		Maximum Immersion
	Page	Name of part.	Description	
MISSISSIPPI, 1851 53 *Chief of Engineers Report for 1873.	224 224 114* 224	Surf Float, Connector Sub Float,		1"
MISSISSIPPI, 1856 (under 5 depth)	224 „ „	Surf. Float { 1° 2° Connector, Sub Float,	Light pine, 5½" × 5½" × ½", Hollow tin ellipsoid, 5½" × 1½", Cord $\frac{1}{16}$" thick, Paint keg, 9" × 6" diam., (ends removed),	7⅜" 7⅜" 5
MISSISSIPPI, 1856 (over 5 depth)	224 „ „	Surf Float { 1° 2° Connector, Sub Float,	Light pine, 5½" × 5½" × ½", Hollow tin ellipsoid, 5½" × 1½", Cord < $\frac{5}{16}$" thick, Keg, 12" × 8" diam., (ends removed,)	7⅜" 7⅜" 10
MISSISSIPPI, 1859	252 „ „	Surf. Float, Connector, Sub-Float,	Cork disc, 2" diam × ½", Fine wire, (size not stated), Cross (+) of 4 strips of tin 4" × 2" on edge, with cork disc 2" diam × ½",	½" 6 ..
CONNECTICUT 1871 74.	48 „ „	Surf Float, Connector, Sub-Float,	and 7½"	7¼" 22 .
IRRAWADDI, 1872	16 & 17	Surf Float, Connector, Sub Float,	Light wood disc, 6" diam × 1", Cord, $\frac{1}{16}$" thick, varnished, Wood-cylinder, 12" × 6" diam., loaded below,	¾" 70
ROORKEE, 1875 * Report of 1874-5.	54* „ „	Surf. Float, Connector, Sub-Float,	Cork disc, 1" diam. × ½", Black silk thread, about $\frac{1}{32}$" thick, Cross (+) of 2 sheets tin discs 3" diam., on edge with cork disc 1" diam. × ½" thick,	½" 6 .
ROORKEE, 1875-6.	Chapter on Double Floats	Surf Float, Connector Sub-Float,	Pine disc 3" diam × ¾" Brass wire No. 30 B W G = ·012" thick, Heavy wood ball 3" diam., loaded,	¼" 10 ..
ROORKEE, 1876-79		Surf. Float, Connector { 1° 2° Sub-Float,	Cork disc, 1" diam. × ½", Black silk thread, $\frac{1}{32}$" thick (in 1876-78), Black silk thread, $\frac{1}{16}$" thick, (from May 78 only a few cases) Hollow shell of thin sheet copper, 1¼" diam., loaded below,	$\frac{3}{16}$" 10 10

MODERN EXPERIMENTS.

Weight.	Reserve Buoyancy.	Tension of Connector.	Area of Surfaces in square inches		Relative Surface. (Sub-Float=1).	
			exposed to direct current-pressure.	exposed to lateral current-adhesion	Direct.	Lateral.
?	?	..	$(8" \times \sqrt{2}) \times 1\ 5" .. = 17$	$2 \times 17 + 8" \times 8" .. .. = 98$	11	33
?	..	?	$\frac{2}{10}" \times (100 \times 12)" . = 240$	$2 \times 240 .. .. .. = 480$	1 60	1 60
8 1 oz.	..	?	$\frac{1}{10}" \times (100 \times 12)" .. = 120$	$2 \times 120 .. .. .. = 240$	80	80
130 oz	..	..	$15" \times 10" .. .. = 150$	$2 \times 150 + ?$ (for edges) $= 300+$	1	1
?	?	..	$(5\ 5" \times \sqrt{2}) \times \frac{1}{8}" .. = 2\ 92$	$2 \times 2\ 92 + 5\ 5" \times 5\ 5" .. = 36\ 1$	05	33
?	?	..	$\frac{1}{2} \times \frac{1}{4}\pi \times 5\ 5" \times 1\ 5" = 3\ 25$	$2 \times 3\ 25 + \frac{1}{4}\pi \times 5\ 5" \times 5\ 5" = 30\ 3$	06	28
?	..	?	$\frac{1}{10}" \times (5 \times 12)" .. = 6$	$2 \times 6 .. .. . = 12$	11	11
?	..	..	$9" \times 6" .. .. = 54$	$2 \times 54 + ?$ (for edges) $.. = 108+$	1	1
?	?	..	$(5\ 5" \times \sqrt{2}) \times \frac{1}{8}" .. = 2\ 92$	$2 \times 2\ 92 + 5\ 5" \times 5\ 5" .. = 36\ 1$	03	19
?	?	..	$\frac{1}{2} \times \frac{1}{4}\pi \times 5\ 5" \times 1\ 5" = 3\ 25$	$2 \times 3\ 25 + \frac{1}{4}\pi \times 5\ 5" \times 5\ 5" = 30\ 3$	03	16
?	..	?	$\frac{2}{10}" \times (70 \times 12)" .. = 168$	$2 \times 168 .. .. .. = 336$	1 75	1 75
?	..	..	$12" \times 8" .. .. = 96$	$2 \times 96 + ?$ (for edges) $.. = 192+$	1	1
?	?	..	$2" \times \frac{1}{8}" .. .. = 25$	$2 \times 25 + \frac{1}{4}\pi \times 2" \times 2" .. = 3\ 64$	01	03
?	..	?	? .. .. = ?	? + ? .. .. = ?	?	?
?	..	..	$8" \times 2" + 2" \times \frac{1}{8}" .. = 17$	$2 \times 17 + 2 \times \frac{1}{4}\pi \times 2" \times 2" = 40\ 3$	1	1
4 oz.	11 oz	..	$\frac{1}{4} \times \frac{1}{2}\pi \times 6" \times 1\ 5" .. = 3\ 5$	$2 \times 3\ 5 + \frac{1}{4}\pi \times 6" \times 6" .. = 35\ 3$	03	21
?	..	8 oz.	$036" \times (22 \times 12)" = 9\ 5$	$2 \times 9\ 5 .. .. .. = 19$	13	11
90 oz.	..	..	$8\ 5" \times 8\ 5" .. .. = 72\ 25$	$2 \times 72\ 25 + 2 \times \frac{1}{4}\pi \times (8\ 5" + 7\ 5") \times 1" .. = 169\ 6$	1	1
4 1 oz	4 1 oz	..	$6" \times \frac{1}{8}" .. .. = 4\ 5$	$2 \times 4\ 5 + \frac{1}{4}\pi \times 6" \times 6" .. = 37\ 3$	06	19
?	..	8 2 oz.	$\frac{1}{10}" \times (70 \times 12)" .. = 52\ 5$	$2 \times 52\ 5 .. .. .. = 105$	73	52
204 5oz	..	..	$12" \times 6" .. .. = 72$	$2 \times 72 + 2 \times \frac{1}{4}\pi \times 6" \times 6" = 200\ 5$	1	1
?	?	..	$1" \times \frac{1}{8}" .. .. = 125$	$2 \times 125 + \frac{1}{4}\pi \times 1" \times 1" = 1\ 04$	02	07
?	..	?	$\frac{1}{80}" \times (6 \times 12)" .. = 9$	$2 \times 9 .. .. . = 18$	13	11
?	..	..	$\frac{1}{4}\pi \times 3" \times 3" .. = 7\ 1$	$2 \times 7\ 1 + 2 \times \frac{1}{4}\pi \times 1" \times 1" = 15\ 8$	1	1
?	?	..	$3" \times \frac{1}{8}" .. .. = 75$	$2 \times 75 + \frac{1}{4}\pi \times 3" \times 3" .. = 86$	11	30
24 gr	..	?	$012" \times (10 \times 12)" = 1\ 44$	$2 \times 1\ 44 . .. .. = 2\ 88$	20	10
?	..	..	$\frac{1}{4}\pi \times 3" \times 3" .. = 7\ 1$	$4 \times 7\ 1 .. .. .. = 28\ 4$	1	1
?	6 gr. to 15 gr	..	$1" \times \frac{2}{10}" .. .. = 2$	$2 \times 2 + \frac{1}{4}\pi \times 1" \times 1" .. = 1\ 19$	10	14
?	?	30 gr	$\frac{1}{100}" \times (10 \times 12)" .. = 1\ 0$	$2 \times 1\ 0 .. .. .. = 2\ 0$	48	24
?	?	30 gr	$\frac{1}{10}" \times (10 \times 12)" .. = 1\ 5$	$2 \times 1\ 5 .. .. .. = 3\ 0$	72	36
540 gr	..	..	$\frac{1}{4}\pi \times 1\frac{1}{2}" \times 1\frac{1}{2}" .. = 2\ 07$	$4 \times 2\ 07 .. .. .. = 8\ 3$	1	1

ABSTRACT TABLE 3.

VERTICAL VELOCITY-CURVES—ABSTRACT OF RESULTS.

This Table is an Abstract from the Detailed Tables VII—XV., with additional Results

Two lines are devoted to each Series The Mean Results are shown throughout the Ranges are shown in second line of sub Col. H and of Cols 3 6 8 and Probable Errors in second line of Col 11

SITES.	1		2			3		4		6		8				9				10					11			
	Position of Vertical	Serial No	Sub Float: Number of Sets Wood (W) Copper (C) Longest Connector	Rod: Number of Sets Wood (W) Tin (T) Length	Average Depth in Float Course H	Surface Fall: Upper Sub-Reach F_1	Surface Fall: Lower Sub Reach F_2	Average Wind: Direction	Average Wind: Velocity	Surface Velocity v_0	Bed Velocity v_R	Mean Velocity past the vertical: Discharge / Depth U	Approximations: Mid-depth Velocity $v_{\frac{1}{2}R}$	Approximations: By $\frac{1}{4}$ depth Velocity v_m	Approximations: Rod Velocity v	Differences: $(U - v_0)$	Differences: $(v_{\frac{1}{2}R} - U)$	Differences: $(v_m - U)$	Differences: $(v - U)$	Ratios: $U - v_0$	Ratios: $U - v_{\frac{1}{2}R}$	Ratios: $U - v_m$	Ratios: $U - v$	Ratios: $v_R - v_0$	Parabolic Elements: Depth of max. velocity Z	Parabolic Elements: Z — H ζ	Parabolic Elements: Max velocity V	Parabolic Elements: Parameter p
SOLANI LEFT AQUEDUCT CENTRAL	1		20 w 9	20 w 9	9 46 25	5 67 15	5 20 30	SW$\frac{1}{2}$W	2	4 25 28	3 51 68	3 99 16	4·04 40	3 98 ?	3 77 55	− 26	+ 05	− 01	− 22	939	988	1 002	1 058	826	36 31	038	4 25 01	102 4 8 2
	2		22 w 8	None	8 90 05	5 71 05	4 86 05	SE$\frac{1}{2}$E	1	4 34 58	3 57 55	4 11 21	4 21 25	4 13 ?	?	− 23	+ 10	+ 02	?	·947	976	995	?	823	1 30 19	145	4 35 01	69 7 3 6
	3		12 w 6	12 w 6	7 25 00	5 85 00	3 83 05	S	3	3 82 34	3 27 67	3 63 21	3 65 24	3 51 ?	3 56 39	− 19	+ 02	− 06	− 07	950	995	1 017	1 020	856	1 04 51	143	3 86 03	42 2 7 6
	4		4 w 5	4 w 5	5 92 05	5 88 05	2 50 05	S	15	3 47 07	3 03 35	3 33 10	3 39 20	3 25 ?	3 32 33	− 15	+ 07	− 07	00	957	979	1 022	1 000	873	1 15 44	194	3 53 04	27 7 4 9

SOLANI RIGHT AQUEDUCT, Left Aqueduct open, CENTRAL	5	16 c 10	16 T 9½	9 94 22	5 98 10	5 45 17	NEbE 2	4 58 83	4 42 46	4 61 19	4 62 42	4 58 ?	4 3 37	+ 03	+ 01	– 03	– 30	1 007	998	007	1 070	96?	3 23 75	325	4 72 05	89 3 13 2
	6	16 c 9	13 T 9 3 T 8½	9 41 21	5 84 10	5 23 33	NEbE 4	4 23 87	4 1 51	4 27 18	4 32 34	4 22 ?	4 08 47	+ 04	+ 05	– 05	– 19	1 009	988	1 012	1 047	986	3 08 70	327	4 37 05	89 5 12 6
	7	18 c 8	18 T 8	8 8? 15	5 80 10	4 86 15	sbW 5	4 07 87	3 63 55	4 00 23	4 07 38	4 00 ?	3 8? 29	– 07	+ 07	00	– 15	983	983	1·000	1·039	892	2 34 1 43	264	4 13 04	79 2 47 8
	8	16 c 8	16 T 8	8 42 23	5 82 05	4 62 23	NEbN 2	4 03 42	3 69 61	3 95 20	4 02 40	3 92 ?	3 77 22	– 08	+ 07	– 03	– 18	980	983	1 008	1 048	916	1 78 49	211	4 10 03	70 5 9 9
	9	14 c 8	12 T 8 2 T 7½	8 32 21	5 98 69	4 53 61	sbW 2	4 28 98	3 98 96	4 32 73	4 25 84	4 26 ?	? 98 78	+ 04	– 07	– 06	– 34	1 009	1 016	1 014	1 08?	930	2 22 77	207	4 38 05	75 0 13 9
	10	2 c 8	2 T 7	8 13 06	6 02 06	4 43 06	SE 1	4 47 17	4 05 36	4 41 08	4 51 08	4 40 ?	4 03 04	– 06	+ 10	– 01	– 38	987	978	1 002	1 094	906	?	?	?	?
	11	15 c 7	15 T 7	7 7? 16	5 86 09	4 23 15	W 2	4 0 37	3 68 52	3 99 24	4 06 33	4 00 ?	? 79 24	– 06	+ 07	+ 01	– 20	98?	983	998	1 0?3	909	2 04 43	263	4 11 03	62 0 7 2
	12	0 W 7	20 W 7	7 59 10	5 81 10	4 00 10	sbE 2	3 80 44	2 98 54	3 65 22	3 71 45	3 64 ?	3 57 57	– 15	+ 06	– 01	– 08	961	984	1 003	1 022	784	1 48 26	195	3 85 02	48 0 3 6
	13	4 c 7	4 T 6	7 1? 06	6 00 06	3 85 06	Calm	4 05 40	3 63 15	3 99 11	4 06 15	4 01 ?	3 86 04	– 06	+ 07	+ 02	– 13	98?	983	99?	1 034	896	1 89 37	204	4 13 03	49 1 5 0
	14	3 c 6 13 c 7	16 T 6	6 77 30	5·06 08	3 19 52	s/w 3	3 86 75	3 61 51	3 91 29	3 95 28	3 85 ?	3 77 40	+ 05	+ 04	– 06	14	1 013	990	1 016	1 037	93?	2 27 62	33?	4 03 07	36 4 6 4
	15	9 c 6	3 T 5½ 6 T 6	6 22 10	6 1? 30	2 62 50	N 3	4 09 61	3 77 47	4 03 33	4 0 42	4 00 ?	3 77 28	– 06	+ 07	– 03	– 26	98?	983	1 008	1 069	922	1 60 38	2?7	4 16 03	42 2 5 2
	16	16 c 5	16 T 5	6 01 05	6·37 28	2 81 05	S 4	3 98 32	3 56 50	3 89 12	3 92 23	3 86 ?	3 82 13	– 09	+ 03	– 03	07	977	992	1 008	1 018	894	1 33 35	221	4 14 03	33 7 4 6
	17	3 c 5	3 T 5	5 55 0	6 3? 0	3 0? 0	S 6	3 74 07	3 2 13	3 66 07	3 76 13	3 (5 ?	3 60 07	– 08	+ 10	– 01	– 06	979	973	1 003	1 017	874	1 38 55	249	3 83 06	27 4 5 7
(L Aq closed) CENTRAL	18	4 c 4	4 T 4	4 66 15	6 40 15	1 66 15	NWbN 6	6 43 1 18	6 14 72	6 40 27	6 43 14	6 39 ?	6 32 20	– 03	+ 03	– 01	– 08	99?	?9?	1 002	1 013	9??	1 23 51	264	6 49 04	30 1 7 1
	19	8 c 3	8 T 3	4 21 26	6 39 26	1 21 26	SW 2	6 05 72	5 61 65	5 85 35	5 8? 69	5 84 ?	5 82 50	– 20	00	– 01	– 03	967	1 000	1 002	1 005	927	6 17 00	1 47	6 29 00	15? 5 0
	20	10 c 3	10 T 3	3 9 21	6 61 21	9? 21	SW 3	5 65 94	5 11 1 00	5 47 53	5 50 58	5 44 ?	5 50 36	– 18	+ 04	– 03	+ 03	968	995	1 006	99?	904	37 15	093	5 66 01	18 7 2 0

ABSTRACT TABLE 4.

VERTICAL VELOCITY-CURVES—ABSTRACT OF RESULTS.

This Table is an Abstract from the Detailed Tables XVI—XXVIII., with additional Results.

Two lines are devoted to each Series. The "Mean Results" are shown throughout; the "Ranges" are shown in second line of Sub-Col. II, and of Cols. 3, 6, 8; and "Probable Errors" in second line of Col. 11.

SITES.	1		2			3			4		6		8				9				10					11			
	Position of Vertical	Serial No.	Sub-Float: Number of Sets; Wood (W), Copper (C); Longest Connector	Rod: Number of Sets; Wood (W), Tin (T); Length	Average Depth in Float-Course. II	Fall of Water-Surface: Upper Sub-Reach F_1	Middle Sub-Reach F_2	Lower Sub-Reach F_3	Average Wind: Direction.	Velocity	Surface Velocity v_0	Bed Velocity v_H	Mean Velocity past the vertical: Approximations: Discharge / Depth U	Mid-depth Velocity $v_{\frac{1}{2}}$	By ¼-depth Velocity v_m	Rod Velocity v	Differences: $(U - v_0)$	$(v_{\frac{1}{2}} - U)$	$(v_m - U)$	$(v - U)$	Ratios: $U \div v_0$	$U \div v_{\frac{1}{2}}$	$U \div v_m$	$U \div v$	$v_H \div v_0$	Parabolic Elements: Depth of max. velocity N	$Z \div H$. ζ	Max. velocity V	Parameter p
SOLANI EMBANKMENT, MAIN SITE	CENTRAL	21	16 C 10	14 T 9 2 T 9½	10·85 ·28	4 77 04	1 19 07	5·33 ·22	E	4	4 39 54	4·08 ·73	4 27 32	4 26 48	4 24 ?	3 97 05	− 12	− 01	− 03	− 30	·973	1·002	1·007	1 076	·929	·27 1 29	025	4 44 ·02	206 5 61·8
		22	5 C 7 11 C 8	14 T 7 2 T 7½	7 93 23	4 61 ·43	1 38 22	3·05 75	SSE	4	3 48 ·31	3 20 ·71	3 47 20	3 55 41	3 42 ?	3 29 22	− 01	+ 08	− ·05	− ·18	997	·977	1·015	1 055	937	2 28 ·51	288	3 61 04	50 9 6 8
		23	10 C 6	10 T 6	7 71 ·03	5 21 03	1 15 00	3 34 03	Calm		4 26 30	3 50 ·79	4·07 23	4 09 33	4 10 ?	4 00 ·20	− 19	+ 02	+ 03	− 07	955	995	·993	1 018	·822	49 ·98	·063	4 23 03	73 1 26 6
		24	6 C 7	4 T 6½ 2 T 7	7 33 ·11	4 63 09	1 41 04	2 81 22	W	8	3 39 34	2 88 32	3 26 ·18	3 29 16	3 24 ?	3 14 ·18	− ·13	+ 03	− 02	− ·12	·962	·991	1 006	1·038	850	1 06 48	·143	3 13 02	61 2 9 0
		25	12 C 6	12 T 6	7 20 11	5 22 14	1 23 01	3 04 ·10	NNE	4	3 88 ·44	3 34 70	3 74 31	3 81 44	3 74 ?	3 53 ·43	− 14	+ ·07	00	− 21	961	·982	1·000	1·059	·861	1 29 29	·178	3 02 ·02	54 6 5 4
		26	7 C 5	7 T 5	6 56 06	4 86 06	91 00	1 36 06	S	7	2 91 17	2 50 87	2 85 12	2 88 14	2 81 ?	2 82 ·12	− 06	+ ·03	− ·04	− 03	979	·990	1 014	1 011	859	1·58 ·58	213	3 02 06	80 5 6 5
		27	16 C 5	16 T 5	6 24 07	5·02 ·07	1 12 00	2 41 ·07	N	2	3 34 ·32	2 86 87	3 21 21	3 26 39	3 21 ..	3 11 ·90	− 13	+ 05	·00	− ·10	·961	985	1 000	1 032	850	1 09 19	·175	3 37 ·01	45 9 3 5
		28	16 C 5	16 T 5	6 16 24	4 70 ·09	·91 ·01	1 12 08	E	5	2 84 ·37	2 24 53	2 63 19	2 67 32	2 62 ..	2 59 ·32	− ·21	+ ·04	− 01	− ·04	·926	985	1 004	1 015	789	−·13 00	·021	2 81 ·00	62 7 0

SOLANI FIGHT AQUEDUCT	41⅓L	29	16 c 8	16 t 8	8 39 22	5 80 18	No middle Sub Reach	4 95 25	SSW	2	2 34 54	2 44 59	2 61 33	2 70 38	2 57 ?	2 8 20	+ 29	+ 07	− 06	+ 18	1 124	974	1 023	936	1 043	4 65 1 17	554	2 70 12	69 4 13 9
	41⅓L	30	5 c 7	5 t 7	6 96 20	5 80 07		3 94 15	N	1	2 42 26	2 54 ·58	2 75 12	2 8 16	2 70 ?	2 92 27	+ 31	+ 08	− 03	+ 19	1 128	972	1 011	935	1 000	3 47 93	499	2 83 15	32 4 6 9
	41¼L	31	16 c 8	16 t 8	8 45 23	5 79 10		4 59 30	S	7	2 2 44	2 61 76	2 9 20	3 03 27	2 92 ?	2 97 35	+ 19	+ 09	+ ·01	+ 06	1 070	970	997	980	960	4 12 63	488	3 01 06	63 5 7 4
	40L	32	2 w 14 c 8	16 w 8	8 64 15	5 81 10		4 73 05	S	7	3 07 54	99 39	3 28 23	3 37 24	3 27 ?	3 37 36	+ 21	+ 09	− 01	+ 09	1 068	970	1 003	973	974	3 90 25	457	3 40 03	47 7 2·3
	40L	33	16 c 8	5 w 8 11 t 8	8 62 20	5 86 10		4·64 28	SSW	3	3 14 70	3 29 1 15	3 40 42	3 44 37	3 36 ?	3 42 43	+ 26	+ 04	− 04	+ 02	1 083	988	1 012	994	1 048	4·38 67	·508	3 49 08	56 6 6 8
	37½I	34	16 w 9	16 w 9	9 42 20	5 80 10		5 24 15	S	4	3 52 49	3 21 53	3 68 14	3 83 35	3 64 ?	3 68 26	+ 16	+ 15	− 04	00	1 045	961	1 011	1 001	912	3 69 25	392	3 87 04	42 3 2 0
	30L	35	4 w 9	4 w 9	9 5 23	5 79 10		5 37 18	WSW	7	4 16 26	3 60 53	4 10 25	4 15 21	4 09 ?	3 92 45	− 06	+ 05	− 01	18	986	988	1 002	1 046	860	2 57 78	269	4 28 06	67 1 11 1
	30L	36	15 w 9	15 w 9	9 33 18	5 81 10		5 20 10	SWbS	3	4 1 45	3 69 86	4 04 40	4 10 48	4 03 ?	3 95 45	09	+ 06	− 01	− 09	978	980	1 002	1 023	893	2 23 49	239	4 23 03	67 8 7 3
	30L	37	18 w 9	18 w 9	9 01 15	5 84 12		4 98 15	SbW	3	4 12 34	3 58 24	3 96 17	4 03 35	3 91 ?	3 75 29	− 16	+ 07	05	− 21	961	983	1·013	1 006	869	1 28 31	142	4 14 01	87 0 7 3
	30R	38	12 w 9	12 w 9	9 17 18	5 84 30		5 12 15	S	4	3 53 55	33 79	3 73 22	3 87 23	3 71 ?	3 63 42	+ 10	+ 14	− 02	− 10	1 008	964	1 005	1 028	917	3 01 23	·394	3 87 03	53 1 2 3
	30R	39	4 w 9	4 w 9	8 8 00	5·80 00		4 9 00	SWbS	7	3 93 34	3 45 16	3 85 06	3 96 11	3 87 ?	3 66 04	08	+ 11	+ 02	− 19	980	972	995	1·002	876	2 55 48	288	4 00 03	68 8 7 6
	37½R	40	16 w 8	16 w 8	8 68 20	5 80 20		4 74 25	S	3	3 13 34	2 92 60	3 27 13	3 39 31	3 25 ?	3 36 29	+ 14	+ 12	− 02	+ 09	1 044	965	1·006	973	933	3 41 36	393	3·42 05	43 8 3 2
SOLANI EMBANKMENT MAIN SITE	79⅓L	41	16 c 2	16 t 2½	2 56 11	4 08 02	1 20 04	4 84 09	VbS	5	2 54 39	2 65	2 40 31	2 42 42	2 39 ?	2 32 38	− 14	+ 02	− 01	− 08	945	999	1·004	1 034	854	− 14 00	·054	2 54 00	18 2 0
	75½L	42	16 c 5	3 t 5 13 t 5½	5 60 26	4 86 48	1 17 20	5 22 22	SEbE	6	3 40 51	3 03 1 16	3 29 43	3 32 63	3 28 ?	3 01 48	− 11	+ 03	− 01	− 28	968	991	1 003	1 093	891	·61 63	109	3 42 02	56 8 15 6
	75½L	43	16 c 8	6 t 3 10 t 3½	3 61 31	4 61 11	1 37 03	3 8 20	SbE	3	2 66 43	2 23 73	2 5 29	2 55 26	2 51 ?	2 38 31	− 15	+ 04	00	− 13	944	984	1 000	1 035	838	− 17 26	·047	2 66 01	33 3 6 3
	74½L	44	5 c 8	5 t 8	8 78 28	4 61 14	1 22 09	4 41 1 13	NEbN		2 83 40	2 26 27	2 53 05	2 42 11	2 50 ?	2 36 12	− 30	− 11	− 03	− 1	894	1 045	1·012	1 072	799	54 38	?	2 83 02	28 9 5 8
	74½L	45	6 c 8	6 t 8	8 4 19	4 59 09	1 22 06	4 36 13	WNW	4	2 70 17	2 2 53	2 49 14	2 43 ·08	2 44 ?	2 39 09	− 21	− 06	− 05	− 10	922	1·025	1 020	1 042	841	61 38	?	2 71 01	50·0 10 1
	74½L	46	8 c 8	8 t 8	8·1 18	4 61 08	1·27 11	4 12 15	NNW	1	2 63 23	2 8 43	2 40 15	2 40 40	2 35 ?	2 3 18	− 23	00	− 05	− 09	913	1·000	1·021	1 039	829	− 76 47	?	2 64 01	73·7 21 9

MOST PROBABLE PARABOLA.

Coefficients of A, B, C; of v_x in values of L, M, N; of L, M, N; Weights of A, B, C, &c.

Coefficient Symbol.	Value of Coefficients of A, B, C.								Equation of Parabola.
	$x=3$	$x=4$	$x=5$	$x=6$	$x=7$	$x=8$	$x=9$	$x=10$	
$\Sigma^x(n+1-x)$,	10	15	21	28	36	45	55	66	$v = A + Bx + Cx^2$.
$\Sigma^x(\overline{n+1-x}\,.\,x)$,	10	20	35	56	84	120	165	220	
$\Sigma^x(\overline{n+1-x}\,.\,x^2)$,	20	50	105	196	336	540	825	1,210	
$\Sigma^x(\overline{n+1-x}\,.\,x^3)$,	45	145	371	812	1,596	2,893	4,917	7,942	
$\Sigma^x(\overline{n+1-x}\,.\,x^4)$,	116	479	1,449	3,724	8,400	17,413	33,305	57,658	

Coefficients of v_x in values of L, M, N.

Argument, (x).	$n=3$			$n=4$			$n=5$			$n=6$			$n=7$			$n=8$			$n=9$			$n=10$		
	L	M	N	L	M	N	L	M	N	L	M	N	L	M	N	L	M	N	L	M	N	L	M	N
	$(n+1-x)$	$(n+1-x).x$	$(n+1-x).x^2$	$(n+1-x)$	$(n+1-x).x$	$(n+1-x).x^2$	$(n+1-x)$	$(n+1-x).x$	$(n+1-x).x^2$	$(n+1-x)$	$(n+1-x).x$	$(n+1-x).x^2$	$(n+1-x)$	$(n+1-x).x$	$(n+1-x).x^2$	$(n+1-x)$	$(n+1-x).x$	$(n+1-x).x^2$	$(n+1-x)$	$(n+1-x).x$	$(n+1-x).x^2$	$(n+1-x)$	$(n+1-x).x$	$(n+1-x).x^2$
	$(n+1)$	(n)	$(n-1)$	$(n+1)$	(n)	$(n-1)$	$(n+1)$	(n)	$(n-1)$	$(n+1)$	(n)	$(n-1)$	$(n+1)$	(n)	$(n-1)$	$(n+1)$	(n)	$(n-1)$	$(n+1)$	(n)	$(n-1)$	$(n+1)$	(n)	$(n-1)$
1	2	1	..	3	1	..	4	1	..	5	1	..	6	1	..	7	1	..	8	1	..	9	1	..
2	1	1	..	2	2	..	3	3	..	4	4	..	5	5	..	6	6	..	7	7	..	8	8	..
3	..	..	..	1	2	..	2	3	..	3	4	..	4	5	..	5	6	..	6	7	..	7	8	..
4	..	..	..	..	..	..	1	2	..	2	3	..	3	4	..	4	5	..	5	6	..	6	7	..
5	..	..	..	..	..	..	..	..	..	1	2	..	2	3	..	3	4	..	4	5	..	5	6	..
6	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	2	3	..	3	4	..	4	5	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	2	3	..	3	4	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	2	3	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Argument, (x)	Coefficients of L, M, N in values of A, B, C.										Weights of A, B, C.			Square Roots of Weights of A, B, C.		
	A				B				C							
	α	λ_1	μ_1	ν_1	β	λ_2	μ_2	ν_2	γ	λ_3	μ_3	ν_3	G_a	G_b	G_c	$\sqrt{G_a}$	$\sqrt{G_b}$	$\sqrt{G_c}$
3	10	15	−20	6	42	−15	35	−10	42	9	−15	5	413	111	84	20·3	10·5	9·2
4	140	26	−25	7	168	−30	63	−17	168	6	−17	5	546	246	336	23·4	15·7	18·3
5	252	37	−30	8	168	−20	33	−7	504	10	−21	6	602	503	1008	24·5	22·4	31·8
6	84	13	−7	1	252	−21	15	−1	252	3	−5	1	648	900	2524	25·4	30·0	50·2
7	132	15	−8	1	2,772	−168	168	−28	2,772	21	−29	4	1715	1474	5544	41·4	38·4	74·4
8	990	84	−45	5	1,848	−84	84	−11	5,544	25	−35	5	1507	2261	11,088	38·8	47·6	105·3
9	1,430	101	−50	5	10,230	−390	363	−37	10,296	39	−37	4	1815	3378	25,740	42·6	58·1	160·4
10	2,002	122	−55	5	15,015	−455	374	−41	15,015	45	−41	4	1641	4431	34,034	40·5	66·6	184·5

DEPRESSION OF MAXIMUM VELOCITY LINE

Central Vertical.

The Series are arranged by order of increasing re ative depth of max ve oci y line at each S te
Argum nt, $\zeta = z - H$

Solani Sites	Serial No	Number of Sets	Data: Depth	Data: Surface Fall: Sub-Reaches: Upper	Middle	Lower	Data: Mean Velocity	Data: Average Wind: Direction	Velocity	Depth of maximum velocity: Actual	Probable Error	Relative
			H	F_1	F_2	F_3	U			z	$\pm R_z$	ζ
Left Aqueduct	1	20	9 46	5 67	No Middle Sub-Reach.	5 30	3 99	SWbW	2	36	31	038
	3	12	7 25	5 85		3 83	3 63	S	3	1 04	51	143
	2	22	8 96	5 71		4 86	4 11	SEbE	1	1 30	19	145
	4	4	5 92	5 88		2 52	3 32	S	15	1 15	44	194
Right Aqueduct [Left Aq closed]	19	8	4 21	6 39	No Middle Sub Reach	1 21	5 85	SW	2	-6 17	·00	-1 47
	20	10	3 99	6 61		99	5 47	SW	3	37	15	·093
	18	4	4 66	6 40		1 66	6 40	NWbW	6	1 23	·51	264
Right Aqueduct [Left Aqueduct open]	12	20	7 59	5 81		4 09	3 65	SbE	2	1 48	26	195
	8	16	8 42	5 82		4 62	3 95	NEbN	2	1 78	49	211
	16	16	6 01	6 3*		2 8	3 89	S	4	1 33	35	221
	17	3	5 55	6 35		3 05	3 66	S	6	1 38	55	·249
	15	9	6 22	6 15		2 62	4 02	N	3	1 60	·38	·257
	11	15	7 75	5 86		4 23	3 99	W	2	2 04	43	263
	13	4	7 15	6 06		3·85	3 99	Calm		1 89	37	264
	7	18	8 85	5 80		4 86	4 00	SbW	5	2 34	1 43	264
	9	14	8 32	5 98		4 53	4 32	SbW		2 22	77	267
	5	16	9 94	5 98		5 45	4·61	NEbE	2	3 23	75	3*5
	6	16	9 41	5 84		5 23	4 27	NEbE	4	3·08	70	327
	14	16	6 77	5 96		3 19	3 91	SbW	3	2 27	6*	·33*
Embankment, Main Site.	28	16	6 16	4 70	91	1 12	2 63	N	5	- 13	·00	-·021
	21	16	10 89	4 77	1 19	5 39	4 27	E	4	27	1 29	·025
	23	10	7 19	5 21	1 15	3 34	4·0,	Calm.		49	98	·063
	24	6	7 39	4 63	1 41	2 81	3 26	W	8	1·06	48	143
	27	16	6 24	5 01	1 12	2 41	3 21	N	2	1 09	19	175
	25	12	7 26	5 22	1 23	3 02	3 74	NNE	4	1 29	29	178
	26	7	6·50	4 86	91	1 38	2 85	S		1 58	58	·243
	22	16	7 93	4 64	1 38	3·05	3 4,	SSE	4	2·*8	51	288

PARAMETER-VARIATION.

Central Vertical Velocity-Parabolæ.

The Sets are arranged by order of decreasing parameter at each S to (Argument, p)

Serial No.	Number of Sets	Parameter. Magnitude p	Parameter. Probable Error. ± R_p	Data. Depth H	Depth of Max Velty Z	Mean Velty U	Surface-Fall Upper Sub-Reach F_1	$(v_{1H}-U)$	Trial Quantities for tracing parameter variation. $H^2-12\,(v_{1H}-U)$.	H^2-U	$H^2-\sqrt{U}$	$H^2-\sqrt{\beta U}$.	$(H-Z)$.	$(H-Z)^2$	$(H-Z)^2-\sqrt{U}$.	$(H-Z)^2-U$	$(H-Z)^2-\sqrt{HF}$
Solání Left Aqueduct.																	
1	20	102 4	8 2	9 46													
2	22	69 7	3 6	8 96													
3	12	42 2	7 6	7 25													
4	4	27 7	4 9	5 92													
Solani Right Aqueduct [Left Aqueduct closed]																	
19	8	155 5	0	4 21	−6 17	5 85	6 39	∞	∞	3 0	7 3	8 7	10 38	107 7	44 5	18 42	20 77
18	4	30 1	7 1	4 66	1 23	6 40	6 40	+ 03	60	3 4	8 6	10·4	3 43	11 8	4 7	1 83	2 15
20	10	18 7	2 0	3 99	37	5 47	6 61	+ 03	44	2 9	6·8	8·0	3 62	13 1	5 6	2 39	2 54
Solání Right Aqueduct.																	
6	16	89 5	12 6	9 41													
5	16	89 3	13 2	9 94													
8	16	79 5	9 9	8 42													
7	18	79 2	47 8	8 85													
9	14	75 0	13 9	8 32													
11	15	62 0	7 2	7 75													
13	4	49 1	5 0	7 15													
12	20	48 0	3 6	7 59													
15	9	42 2	5 2	6·22													
14	16	36 4	6 4	6 77													
16	16	33 7	4 6	6 01													
17	3	27 4	5 7	5 55	1 38	3 66	6 35	+ 10	26	8 4	16 1	20·1	4 17	17 4	9 1	4 75	2 92
Solani Embankment, Main Site																	
21	16	206 5	61 8	10·89													
23	10	73 1	26 6	7 79													
28	16	62 7	0	6 16													
24	6	61 2	9 0	7·39													
25	12	54 6	5 4	7 26													
22	16	50·9	6 8	7·93													
27	16	45·9	3 5	6 24													
26	7	30 5	6 5	6 50													

MEAN VELOCITY PAST CENTRAL VERTICAL, VARIATION.

The Series are arranged by order of decreasing Mean Velocity past the vertical (Argument, U)

Serial No.	Number of Sets	Mean Velocity	DATA: Surface Velocity	DATA: Depth	DATA: Surface-Fall: Upper Sub-Reach	DATA: Surface-Fall: Middle Sub-Reach	DATA: Surface-Fall: Lower Sub-Reach	DATA: Surface-Fall: Whole Reach	TRIAL QUANTITIES for approximation to the Mean Velocity. Type IIF.			Type $\sqrt{HF}$		Other Types				Ratio U − ₀
		U	v_0	H	F_1	F_2	F_3	F	HF_1	HF_3	IIF	$\sqrt{HF_3}$	$\sqrt{IIF}$	$F_3\sqrt{H}$	$F_1^3\sqrt{H}$	$F_1\sqrt[3]{H}$	$\sqrt{F_1\sqrt{H}}$	c
SOLANI LEFT AQUEDUCT																		
2	22	4 11	4 34	8 96	3 71													
1	20	3 99	4 25	9 46	5 67													
3	12	3 63	3 82	7 25	5 85	No Middle Sub-Reach				No Middle Sub-Reach								
4	4	3 3.	3 47	5 92	3 88													
SOLÁNI RIGHT AQUEDUCT [Left Aqueduct closed]																		
SOLANI RIGHT AQUEDUCT																		
												113 6	7 71	10 66	18 8	111 9	10 58	4 34
SOLANI EMBANKMENT, MAIN SITE																		

Serial No.	Number of Sets	Mean Velocity	Ratio U − ₀
2	22	4 11	947
1	20	3 99	939
3	12	3 63	950
4	4	3 3.	957
			1 007
			973
			955
			964
			997
			962
			961
			979
			926

ABSTRACT TABLE 9.

ROD-MOTION, COMPARISON i.

Solási Twin Aqueducts—Central Vertical.

Rod-Velocity of Rods of 1', 2', 3', &c., n feet immersion compared with Mean Velocity-Measurement through 1', 2', 3', &c. n feet depth deduced from Double-Floats.

Site	1 Serial No. Present	1 Serial No. 1874-5 Report	1 Instrument	1 Description of each line	1 Number of Rods	2 Depth on vertical H	3 Surface-Fall. Upper 6 miles F_1	3 Surface-Fall. Lower 4½ miles F_2	4 Average Wind. Direction	4 Average Wind. Velocity	6 Rod-Velocities (u_n) and Double-Float Mean Velocities (U_n') past the central vertical through depths named below. Nominal Depths (n)	0	1	2	3	4	5	6	7
Solani Left Aqueduct	.	11R	Rods	Means.	1	7 2	5-80	3-83	S	12	u_n=	3-82	3 88	3 86	3 80	3 78	3 66	3 55	?	3
				Ranges.		-00	-00	00	..		..	34	54	25	24	34	31	39	..	
	3	11B	Double-Floats	Means.	1	7-2	5-80	3-83	S	9	U_n'=	3-82	3 8	3-87	3 86	3 81	3 76	3 70	?	3
				Ranges.		00	00	00	..		..	34	..	.		..	..			2
			Differences ($u_n - U_n'$),				..	.	..			-00	+ -03	- -01	- -06	- 03	- 10	- 15		- -0
Solani Left Aqueduct	.	10R	Rods	Means.	4	5-9	5-83	2-82	S	15	u_n=	3 47	3 58	3 43	3 42	3 34	3 31	..	.	3 31
				Ranges.		-05	-05	05	.		..	07	04	13	16	14	-33	.	.	33
	4	10B	Double-Floats	Means.	4	5-9	5-88	2-8	S	15	U_n'=	3 47	3 51	3-53	3-51	3 45	3 39	..	..	3 32
				Ranges.	.	05	05	0	..		..	..	..	..	.		..	..	..	10
			Differences ($u_n - U_n'$),				..	.	..			-00	+ -07	- -10	- -09	- -11	- -08	..	.	-01
Solani Right Aqueduct	..	12R	Rods	Means.	20	7-5	5-81	4-0	S b E	12	u_n=	3-80	3-83	3 84	3-85	3 79	3 74	3-64	3 57	3 57
				Ranges.	.	-10	10	10	..	.	..	44	-35	45	30	43	41	47	-57	57
	12	12B	Double-Floats	Means.	20	7 59	5-81	4-03	S b E	12	U_n'=	3-80	3-83	3-85	3-84	3-82	3 78	3 75	3-68	3-65
				Ranges.	.	-10	-10	-10	..	.	..	-30	..	..	..	.	..	..	..	22
			Differences ($u_n - U_n'$),				..	..	..			-00	-00	- -01	+ -01	- -03	- -04	- 11	- 11	-03

ABSTRACT TABLE 10.

EFFECT OF DEPTH ON VELOCITY.

Solání Embankment, Main Site—Abstract of Mean Velocities over Top Immersed Step of either Bank.

(The number of sets of velocity measurements over the top immersed step is not always the same on both banks: the velocity measurements on one bank having been occasionally omitted where the depth of *water on the step* was trifling).

Series	Range of water-level	Left Bank. Number of Sets.	Step No.	Depth on step	Mean Velocities. From — To	Remarks.	Right Bank. Number of Sets.	Step No.	Depth on Step	Mean Velocities. From — To.	Remarks.
151	16	1	4	·09	46	.. ..	5	4	28—12	1 38— ·90	Irregular decrease
		4	5	75—·68	1 84—1 67	Irregular					
152	26	1	4	08	58	.. ..	15	4	27—06	1 36— 64	Fairly regular decrease
		16	5	78—57	2 06—1 52	Irregular decrease	2	5	76	1·68—1 65	
153	28	6	5	51—·23	1 64— ·85	Steady decrease	6	5	70— 42	2·06—1 47	Nearly steady decrease
154	18	5	6	72— 54	1 67—1 34	Nearly steady decrease ..	3	5	·18— 07	2 05— 81	Irregular decrease
							2	6	73—·72	1·90—1 88	
155	29	6	6	35— 06	1 44— 47	Nearly steady decrease ..	6	6	53—·24	2 08— ·96	Nearly steady decrease
156	06	4	7	76— 70	1 55—1 45	Irregular	4	6	18—12	97— ·71	Steady decrease.
157	19	7	7	53—·34	1 42— 96	Irregular decrease . ..	7	7	69—·50	1 74—1 20	Irregular decrease.
158	10	1	7	14	86	.. ..	2	7	·40—·30	1 36—1 19	Steady decrease
159	22	9	8	71— 49	1·59—1 19	Irregular	3	7	13—·05	1 62— 52	Steady decrease.
							3	8	·76— 63	1 66—1 35	Steady decrease.
160	27	1	8	23	68	.. ..	6	8	·37—·10	1 48— 60	Nearly steady decrease.
		2	9	77—·73	1 32—1 21	Increase					
161	15	11	9	65— 50	1 21— 82	Irregular decrease	11	9	78— 63	1 51—1·27	Irregular decrease.
162	26	3	9	32— 17	1 29— 60	Irregular	5	9	45—·19	1 19— ·79	Nearly steady decrease
163	15	2	10	19— 15	73— 63	Decrease	6	10	·31— 16	85— ·76	Irregular decrease.
164	00	1	11	51	60	.. ..	1	11	65	1 49	
165	·15	6	11	28—·13	1 01— 75	Nearly steady decrease ..	6	11	42—·27	98— ·83	Irregular decrease.
166	27	3	12	·53— 26	1 14— 85	Irregular decrease	3	12	68—·41	1·03— 90	Steady decrease.

ABSTRACT TABLE 11

TRANSVERSE VELOCITY CURVES

Area and Discharge Formulæ and Float Course Spacings

e Edge t, top mm med a p q quadriseet n of S de Space m, m ddle of S da Space No v oc y measurements at po nts ma ked w h * or † viz e* q† 75* 8 * 42½* 71½† 40½†
Veloc es at the edge (ie. at e* 75* 84 42½* assumed zero in comput ng Discharge. Veloci ies interpolated n t measured at q† 7 ½† 40½†

SITE		Number of Sets of velocity work	Number of Observed Ordinates.	Area and Discharge Formulæ and Float Course Spacings																					Breadth Bed.	Breadth Surface From	Breadth Surface To
					Left of Centre							+						Right of Centre									
				+	Side Space	+	Inter Space	+			Centre Space				+	Inter Space	+	Side Space	+								
15th Mile Site.	Old Site	13	19	+	*Cubic*	+	*Simson's*	+			*Weddle's*				+	*Simson's*	+	*Cubic*	+								
				*	84	82½	80	75	70	65	60	40	20	0	20	40	60	65	70	75	80	82½	84	e*	?160	175	171
	New Site	4	19	+	*Simson's* modified	+	*Simson's*	+			*Weddle's*				+	*Simson's*	+	*Simson's* modified	+								
				e*	q	m	q†	80	75	70	65	60	40	20	0	20	40	60	65	70	75	80	q†	m	q	e*	160	186	184
Solani Embankment Main Site.	Low Water (below steps)	54	15	+	*Simson's* modified	+	*Simson's*	+			*Weddle's*				+	*Simson's*	+	*Simson's* modified	+								
				75*	73¼	72½	71¼†	70		65		60	40	20	0	20	40	60		65	70	71¼†	72½	73¾	75*	150′	150	150
	High Water (above lowest step	99	16 to 21	+	*Special*	+	*Cubic*	+			*Weddle's*				+	*Cubic*	+	*Special*	+								
				t	q	m	75½	74½	70	65	60	40	20	0	20	40	60	65	70	74½	75½	m	q	t	150	171	151
	Minor Sites	10	17	+	*Simson's*	+	*Simson's*	+			*Weddle's*				+	*Simson's*	+	*Simson's*	+								
				84*	82		80	75	70	65	60	40	20	0	20	40	60	65	70	75	80	82	84*		150	169	168

Solani	Left Aqueduct	45	17	+ *Parabolic* + *Simson's* + *Weddle's* + *Simson's* + *Simson's modified* +			
				42½* 39½ 37½ 35 32½ 30 20 10 0 10 20 30 32½ 35 37½ 40 40⅞† 41¼ 41¾ 42½*	83½	85	82
	Right Aqueduct	186	17	+ *Simson's modified* + *Simson's* + *Weddle's* + *Simson's* + *Parabolic* +			
				42½* 41¾ 41¼ 40⅞† 40 37½ 35 32½ 30 20 10 0 10 20 30 32½ 35 37½ 39½ 42½*	83½	85	82
	Belra	53	15	+ *Simson's* + *Cubic* + *Weddle's* + *Cubic* + *Simson's* +			
				e* m 90 80 70 60 40 20 0 20 40 60 70 80 90 m e*	180	189	187
	Jaol	55	19	+ *Simson's* + *Simson's* + *Cubic* + *Weddle's* + *Cubic* + *Simson's* + *Simson's* +			
				e* m 92½ 87½ 82½ 75 67½ 60 40 20 0 20 40 60 67½ 75 82½ 87½ 92½ m e*	[illegible]18.5	193	191
	Kambera	56	17	+ *Simson's* + *Cubic* + *Simson's* + *Cubic* + *Simson's* +			
				e* m 2[illegible]½ 25 22½ 20 15 10 5 0 5 10 15 20 22½ 25 27½ m e*	[illegible]5.5	66	64
Distributaries	Right Jaoli	4	11	+ *Triangle or Wedge* + *Simson's* + *Triangle or Wedge* +			
				e* 10 8 6 4 2 0 [illegible] 4 6 8 10 e*	[illegible]16	25	22
	Mansurpur	5	13	+ *Triangle or Wedge* + *Weddle's* + *Triangle or Wedge* +			
				e* 6 5 4 3 2 1 0 1 2 3 4 5 6 e*	[illegible]8	14	14
	Mirapur	3	13	+ *Triangle or Wedge* + *Weddle's* + *Triangle or Wedge* +			
				e* 6 5 4 3 2 1 0 1 2 3 4 5 6 e*	[illegible]12	14	14
	Pimora	4	11	+ *Triangle or Wedge* + *Simson's* + *Triangle or Wedge* +			
				e* 5 4 3 2 1 0 1 2 3 4 5 e*	[illegible]8	13	13

MEAN VELOCITY CURVES AT SAME WATER LEVEL — ABSTRACT TABLE 12.

Proportionality of corresponding Velocity Ordinates

Joint Site	Serial No.	No. of Rods	Gauge A or H	Hyd. Mean Depth R	Rod Velocities past each vert cal. * The Reduced Velocities are the Rod velocities of the upper Series reduced in the ratio of the Mean Velocities of the two Series compared	Left of Centre								Centre	Right of Centre							Mean Velocity V	Ratio of V,V
					Distances	42½	41½	40	37½	35	32½	30	20	10		10	20	30	32½	35	37½	39½	42½		
RIGHT AQUEDUCT (L. Aq closed) L. Aq open)	124	1	3 49	3 26	Rod velocy	?	2 20	2 32	2 44	2 61	2 53	2 46	2 47	2 53	2 60	2 65	2 52	2 44	2 21	2 25	2 17	2·03	?	2 43	3 42
					Reduced do	?	64	68	71	76	74	72	72	74	76	78	74	71	65	66	63	59	?	71	
	123	1	3 65	3 40	Rod velocy	?	61	62	70	65	69	68	67	73	72	78	78	76	75	72	73	63	?	71	
					Difference		+ 03	+ 06	+ 01	+ 11	+ 05	+ 04	+ 05	+ 01	+ 04	00	− 04	− 05	− 10	− 06	− 10	− 04		00	
RIGHT AQUEDUCT (L. Aq closed) L. Aq open)	134	1	3 58	3 33	Rod velocy	?	2·08	2 27	2 27	2 70	2 83	2 93	3 19	3 49	3 70	3 59	3 51	3 51	3 39	3 11	2 79	2 78	?	3 22	4 67
					Reduced do	?	45	49	49	58	61	63	68	75	79	77	75	75	73	67	60	60	?	69	
	133	1	3 60	3 30	Rod velocy	?	6	65	71	65	63	65	65	64	71	79	77	73	77	74	73	65	?	69	
					Difference		− 16	− 16	− 22	− 07	− 02	− 02	+ 03	+ 11	+ 08	− 02	− 02	+ 02	− 04	− 07	− 13	− 05		00	
EMBANKMENT MAIN SITE						75	73½	72½	70	65	60	40	20	0	20	40	60	65	70	72½	73½	75			
	170	2	3·64	4 73	Rod velocity	?	99	1 13	1 19	1 28	1 28	1 74	1 68	1 43	1 46	1 64	1 52	1 24	1 08	1 00	93	?	1 50	1 74
					Reduced do	?	57	65	68	74	74	1 00	97	82	84	94	87	71	62	57	53	?	86	
	171	3	3 62	4 72	Rod velocity	?	56	60	64	74	71	1 00	·97	84	89	93	83	68	63	59	52	?	·86	
					Difference		+ 01	+ 05	+ 04	00	+ 03	00	00	− 02	− 05	+ 01	+ 04	+ 03	− 01	− 02	+ 01		00	
	170	2	3 64	4 73	Rod velocity	?	99	1 13	1 19	1 28	1 28	1 74	1 68	1 43	1 46	1 64	1 52	1 24	1 08	1 00	93	?	1 50	2 27
					Reduced do.	?	44	50	52	56	56	77	74	63	64	72	67	·55	48	44	41	?	66	
	172	2	3·58	4 68	Rod velocity	?	39	45	50	52	52	79	71	67	69	75	63	48	43	40	38	?	66	
					Difference		+ 05	+ 05	+ 02	+ 04	+ 04	− 02	+ 03	− 04	− 05	− 03	+ 04	− 07	+ 05	+ 04	+ 03		00	
	177	4	2 42	3 64	Rod velocity	?	90	1·07	1 21	1 26	1 30	1 77	1 62	1 40	1 45	1 67	1 48	1 19	1 06	97	89	?	1 50	1 85
					Reduced do.	?	49	58	65	68	70	·96	88	76	78	90	80	64	57	52	48	?	81	
	178	2	2 43	3 64	Rod velocity	?	55	58	65	71	71	90	84	75	·83	93	80	·65	62	57	54	?	81	
					Difference		− 06	00	00	− 03	− 01	+ 06	+ 04	+ 01	− 05	− 03	00	− 01	− 05	− 05	− 06		00	

SURFACE, MID DEPTH, AND BED VELOCITY CURVES—ABSTRACT OF RESULTS.

This Table is an Abstract of the Detailed Tables XXIX to XXXIII with additions.

The upper line of each Series shows the Mean Results the second line shows the Ranges of the Results.

SOLANI SITES.	1			2					3			4		6	7	8		TRANSVERSAL.
	Detailed Table	Serial No.	Number of Sets	Gauge Reading	Hyd Mean Depth.	Surface-Breadth	FLOATS Sub Float Wood W Copper C	Length of Connector	SURFACE-FALL Upper 5 Miles.	Lower 4½ Miles	Surface Slope Right or Left Bank	AVERAGE WIND Direction	Velocity	Central Velocity	SUPL DISCHARGE in sq ft per sec.	MEAN VELOCITY	Ratio U—v_0	
				A or H	R	b			F_1	F_2	S			v_0	D	U	c	
L. AQUEDUCT	XXIX.	51	15	8 97 15	7 42 09	83 7 2			5 76 05	4 93 ·15	?	SSW	3	4 24 24	329 1 22 ?	3 8 26	·913	
		52	14	8 83 15	7 33 10	83 8 2			5 73 05	4 84 20	?	SSW	3	4 2 45	326 7 22 6	3 84 2(	·908	
RIGHT AQUEDUCT	XXX	53	16	9 90 13	7 92 05	82 0 5	Surface-floats—3" × 4" pine Discs	No Connector used	6 01 18	5 44 23	180 R 030	NE	2	4·76 78	367 ? 45 5	4 33 54	910	SURFACE
		54	4	9 10 20	7 ·0 12	83 4 3			5 68 10	5·08 10	?	NW b W	5	4 19 36	328 7 5 (	3 8 06	924	
		55	1	8 78	7 30	83 9			5 92	4 88	?	SSW	1	4·05	320 ?	3 78	933	
	XXXI.	56	16	8 71 15	7 25 10	83 9 1			5 73 15	4 71 15	?	SSW	2	4 19 79	321 33 4	3 79 40	90·	
		57	16	8·· · 12	7 15 08	84 1 1			6 12 55	4·00 55	?220 R ?055	W b N	7	4 49 89	3·2 41 5	4 1· 49	924 ··	
		58	14	8·07 27	6 81 20	84 4 1			6·17 1 43	4 27 78	?195 R ?115	S b W	1	4 38 98	34· (53 ?	4 06 63	927 ··	
		59	3	7 57 20	6 46 15	84 5 0			?6 03 ? 20	4 07 20	?	S b W	7	4 1· 63	333· 18 1	3·93 21	942 ··	
EMBANKMENT (Minor Sites)	XXXIII.	60	10	9 59 ·16	?	168 4 1 2			5 73 05	4 92 10	?	ESE	6	4 24 65	685 46 5	4 08 2(	962 ··	
R AQUED.	XXXII.	61	16	10·00 24	7 98 15	82 0 0	C	5	5·93 37	5 57 19	?	NE	2	4 6· 6?	36· 1 3·	4 29 44	93(	MID-DEPTH
		62	1	9 0·	7 47	83 ·	C	4(	5 80	4 70	?	SW b S	11	4 3·	350	4 1 ·	9·(	
L. AQUEDUCT	XXXII.	65	3	10·00 00	7 9· 00	82 0 0	C	10	6 08 00	5 52 05	?	NE b E	4	4 5· 0	3·7·(5 4	4 2 ·0(	936	BED
		66	4	8 77 30	7 2 20	83·9 3	W	8	5·81 17	4 8· 25	?	SW b W	1	3·6· 1	294 · 7	·4 ·0·	9· (··	

MEAN VELOCITY CURVES—ABSTRACT OF RESULTS.

This Table is an Abstract of the Detailed Tables XXXIV., XXXV., XLI LVI with additions. The upper line of each Series shows the Mean Results the second line shows the "Ranges" of the Results.

SITES.	1 Detailed Table	1 Serial No	1 Number of Sets	2 Gauge-Reading A or H	2 Hyd Mean Depth R	2 Surface-Breadth b	2 Rod Wood (W) Tin (T)	2 Rod Length l	3 Surface-Fall. Upper 5 miles F_1	3 Surface-Fall. Lower 4½ miles F_2	3 Surface-Slope S (Right or Left Bank)	4 Average Wind Direction	4 Average Wind Velocity	6 Mean Velocity past centre vertical U_o	7 Cubic Discharge D	8 Mean Velocity V	8 Ratio $\frac{V}{U_o} = c$
SOLANI LEFT AQUEDUCT	XXXIV.	101	3	9 90 17	7 94 08	82 2 5	T	9·0 0	5 92 08	5·49 ·14	189 L 012	SE b E	1	4 31 24	3 42 32	4 06 09	942 ..
		102	10	9 63 25	7 79 16	82 5 0	W	9 0 0	5·64 25	5·45 25	?	Calm		3 74 63	2 992 209	3 57 26	955 .
		103	4	9 42 11	7 65 07	82 5 0	T	8 9 5	5 91 16	5·05 51	207 L 017	SW b W	3	3 96 42	3,09 99	3 87 09	977 ..
		104	12	9 05 25	7 47 15	83 5 3	W	8 5 0	5 70 30	5 12 15	?	N	1	3 80 47	2,771 202	3 61 16	950 ..
	XXXV.	105	2	8 61 13	7 19 09	84 0 1	T	8·0 0	5 89 07	4 64 20	222 L 007	W b N	2	3 81 29	2,70 152	3 70 16	971 ..
		106	6	8 02 22	6 78 15	85 0 0	T	7 5 0	5·88 17	4 27 22	?206 L ?032	S b E	4	3 61 27	2 361 238	3 47 20	961 ..
		107	6	7 50 13	6 41 10	85·0 0	T	7 0 0	5 92 15	3 94 08	?225 L ?015	WSW	1	3 54 29	2,18 99	3 43 13	969 ..
SOLANI RIGHT AQUEDUCT [Left Aqueduct closed]	XLI	131	2	4·60 00	4 20 ·00	85·0 0	T	4 0 0	3 60 00	10 00	025 R 002	SW	2	1 3 06	481 19 5	1 24 05	932 ..
		132	2	3 96 05	3 65 04	85 0 0	T	3 0 0	6 17 09	96 05	473 R 015	Calm		5 16 ·04	1 623 51	4 83 09	938 ..
		133	1	3 60	3 35	85 0	T	3 0	4 35	00	?	NE	5	71	212 0	69	972
		134	1	3 58	3 33	85 0	T	3 0	6·22	88	?	SW b S	10	3 40	979 3	3 22	870
		135	1	3 18	2 99	85 0	T	2 5	6 22	·68	203 R	Calm		3 5	865 6	3 20	896
		136	1	3 12	2 94	85 0	T	2 5	6 28	·62	208 R	Calm		3 19	740	2 79	875
		137	1	3 13	2 94	85·0	T	3 0	6 47	43	200 R	SW	6	2 18	667 8	2 51	937
		138	1	2 88	2 72	85 0	T	2·0	6 52	18	145 R	Calm		2 76	600	2 54	920
		139	2	2 66 11	2·52 10	85 0 0	T	2·0 0	5·95 11	16 11	151 R 035	S	1	2 4 19	496·5 58 6	2 20 17	891 ..
DISTRIBUTARIES. Mirzapur	LVI	231	2	4 35 01	2 79 00	25·0 ·0	T	.	No Observations.			Calm		2 67 12	190· 4	2 52 01	·944 .
Right Jaali		232	2	3 10 01	1 99 01	22·0 0	T					Calm		2 32 16	97 7 0	2 10 00	905
Mirzapur Mandalpur		233	4	3 97 23	2 32 07	14 2 3	T		No Observations			N	1	2 36 22	86 4 9 9	2 10 11	890
		234	1	3·60	2 10	13·8	T	.				Calm		2 29	72 6	2 05	895
Mirzapur Pinnora		235	1	3 75	1 63	14·0	T	..	No Observations.			Calm		1 6	41 4	1 59	962
		236	2	2 83 00	1 16 00	13 5 0	T	.				WNW b		1 59 02	25 5 4	1 49 00	937 ..
		237		3 79 ·01	2 16 00	13·0 0	T	..	No Observations			NW b		2 11 05	63·1 5	1 83 02	867
		238	2	3 33 09	1 94 05	12 5 0	T	.				W		1 95 11	50·0 4 3	1 76 08	884 ..

MEAN VELOCITY-CURVES—ABSTRACT OF RESULTS.

This Table is an Abstract of the Detailed Tables XXXVI to XL with additions

The upper line of each Series shows the Mean Results the second line shows the Ranges of the Results.

SITE	1			2					3			4		6	7	8	
	Detailed Table.	Serial No	Number of Sets	Gauge Reading	Hyd Mean Depth	Surface Breadth.	Rod Tin (T) Wood (W)	Rod Length.	Surface Fall Upper ¼ miles	Surface Fall Lower ¼ miles	Surface-Slope (Right Bank	Average Wind. Direction.	Average Wind. Velocity	Mean Velocity past centre vertical	Cubic Discharge	Mean Velocity	Ratio $\frac{V}{U_o} = c$
				H	R	b		l	F_1	F_2	S			U_o	D	V	c
SOLANI RIGHT AQUEDUCT.	XXXVI. XXXVII. XXXVIII. XXXIX. XL.	108	19	9 96 19	7 96 11	82·0 5	T	9 3 5	5 85 24	5 61 28	?18 ?030	NE *b* E	1	4 21 51	3,384 387	4 06 43	950 ..
		109	18	9 61 18	7 78 ·12	82 5 0	T	9·0 ·0	5 91 43	5 24 64	?193 ?018	NE *b* E	3	4·10 89	3,231 513	3 95 61	·950 ..
		110	20	9 33 ·17	7 61 07	82 8 6	W * T	9·0 5	5 86 46	5 22 39	?193 ?022	N	1	3 98 71	3,03· 547	3 83 63	962 ..
		111	16	8·97 16	7 42 10	83 7 2	T	8 ? 5	5 91 ·59	?4 87 ? 54	?19· ?023	N *b* W	1	4 0· 64	2,941 284	3 86 37	958 ..
		112	18	8 58 26	7 16 ·17	84 1 2	T	8 0 0	5 85 19	4 71 39	?208 ?027	NW *b* W	1	3 9· 6·	2,716 250	3 73 29	952 ..
		113	1	8 16	6 88	84 3	T	7 5	5 84	4 36	228	V	1	4 29	2,66·	3 8·	897
		114	20	7 98 16	6 75 11	84 4 0	T	7 1 5	5 85 23	4 28 18	?204 ?015	SSW	3	3 7· 50	2,43· 19·	3 6· 29	957 ..
		115	1	7 80	6 63	84 4	T	7··	6 10	4 10	19·	Calm		3 9·	2.561	3 86	977
		116	7	7 43 16	6 41 12	84 5 0	T	7·0 0	5 95 21	3 79 1 11	?20· ?01·	NW *b* W	1	3 79 43	2,27 223	3 59 17	947 ..
		117	2	7 09 02	6 14 ·02	85·0 0	T	6· 5	6 00 12	3 19 1 18	220 021	NE *b* N	2	3 8· 0·	2,20· 73	3 6· 13	963
		118	16	6 67 23	5 83 17	85·0 0	T	6 0 0	5 99 12	3 21 49	?22· ?015	S	4	3 7· 40	2,03· 155	3 59 17	9··
		119	7	6 15 ·30	5 43 23	85 0 0	T	5 4 5	6 53 67	2 61 1 12	245 133	NNE	1	3 89 2·	1,954 24·	3 74 48	961 ..
		120	9	5 78 30	5 14 24	85 0 0	T	5· 5	5 89 20	2 20 91	?	SSW	3	3 35 4	1,58· 143	3 2· 3·	964 ..
		121	2	5 61 05	5·00 04	85 0 0	T	5·0 0	6 25 ·15	2 31 1 55	240 120	S	2	3 57 30	1,65 12	3 43 06	961 ..
		122	13	4 48 24	4 10 20	85 0 0	T	4· 5	5 82 1 26	?1 81 ? 53	?23 ?135	S *b* E	5	3 0· 75	1,10· 21	2 90 66	951 ..
		123	1	3 6·	3 40	85 0	T	3··	4·30	·0·	?	Calm		72	218	7·	986
		124	1	3 49	3 26	85 0	T	3 0	6 61	1 29	19·	N	5	2·6·	722 2	2 43	935
		125	1	2 02	1 95	85 0	T	1 ·	7 78	42	20	S	1	1 6·	276·	1 6·	976
		126	1	1 92	1 85	85·0	T	1 ·	5 93	?—38	?	S	0	1 20	202·	1 24	1·033
		127	1	70	69	84 3	W		7 40	?·00	11	S	10	5·	35·	6·	1·053

* 12 Sets with wood Rods 9 Sets with tin Rods.

MEAN VELOCITY-CURVES—ABSTRACT OF RESULTS.

This Table is an Abstract of the Detailed Tables XLIII. to XLVI. with additions.

The upper line of each Series shows the "Mean Results", the second line shows the "Ranges" of the Results.

SITE	1			2				3				4		6	7	8	
	Detailed Table.	Serial No.	Number of Pits	Gauge Reading	Hyd Mean Depth.	Surface-Breadth.	Rain (T)	Surface-Fall. Upper 4 miles.	Surface-Fall. 1 mile below Site	Surface-Fall. Lower 4½ miles	Surface-Fall. Surface Slope (Left Bank)	Average Wind. Direction	Average Wind. Velocity.	Mean Velocity just above vertical	Cubic Discharge	Mean Velocity.	Ratio $\frac{V}{V_0}$
				h	R	b		F_1	F_2	F_3	s			V_0	D	V	c
SOLANI EMBANKMENT, MAIN SITE	XLII.	151	5	9·94 16	9·31 ·07	170·1 1·2	T	4·70 ·09	1·25 ·10	3·46 ·20	227 001	E.S.E	4	4· 6	7,17 424	4·02 ·20	·939 ..
		152	1	9·91 ·26	9·17 ·15	170·3 2·3	T	4·73 ·13	1·15 ·20	3·91 ·10	?024	S. & E.	2	4·6 ·6	6,72 545	3·83 ·26	·955 ..
		153	6	9· ·2	8·9 ·21	169·7 0	T	4·72 ·21	1·21 ·19	3·16 ·72	? ·05	S.W. & W.	2	3·8 ·2	6,27 430	3·71 ·20	9·6 ..
		154	5	9·0 ·15	8· ·15	167·0 1·2	T	4·71 ·14	1·32 ·13	4· ·12	? ?03	S.W. & W.	4	3·8 ·3	5,974 429	3·70 ·18	961 ..
	XLIII.	155	6	8·74 ·9	8·4 ·24	166· ·0	T	4·72 ·40	1·26 ·14	4·6 ·30	217 049	W.		3·64 ·7	5,504 1,141	3·59 ·63	932 ..
		156	4	8·43 ·06	8·23 ·01	166· 0	T	3·90 ·03	2·07 ·03	3·03 ·03	? ?	N.E.	2	3·3 ·5	4,88 26	3·24 ·17	961 ..
		157	7	8·12 ·19	8·01 ·16	164·0 ·0	T	4·63 ·07	1· ·14	4· ·23	?21 ?0	W.	1	3· ·64	4·83 4·6	3·32 ·26	949 .
		158	2	7·99 ·10	7·84 ·08	164·0 ·0	T	4·81 ·15	1·29 ·15	4·23 ·25	21 000	W.		3·7 ·0	4, ·65	3·43 ·01	905 .
	XLIV.	159	6	7·59 ·22	7·64 ·13	162· 1·2	T	4·80 1·07	1·25 ·19	3·93 ·15	?214 ?010	W.S.W.	2	3·42 ·3·	4,4 ·59	3·46 ·35	·953 ..
		160	6	7·0 ·27	7·2 ·18	161·3 1·2	T	4·67 ·13	1·22 ·07	3· ·22	214 010	W. & S.	4	3· ·3	4,12 ·91	3·22 ·10	976 ..
		161	11	6·82 ·15	7·12 ·12	159·3 ·0	T	4· ·03	1·27 ·03	3·39 ·35	?217 ?006	S. & E.	4	3·2 ·3	3,86 ·15	3·11 ·11	918 ..
	XLV.	162	7	6· ·26	6·7 ·22	159·3 ·0	T	5·10 ·33	1·14 ·17	3·1 ·30	221 123	S.E. & E.		3·4 1	3,97 ·34	3·39 ·37	9·0 ..
		163	6	6· ·15	6·1 ·12	157·0 0	T	5·11 ·10	1·23 ·01	2·62 ·14	171 ·05	W.S.W.	2	3·34 ·4	3,194 ·28	3·05 ·20	·913 ..
		164	1	5·24	5·9	154·7	T	5·29	1·72	2·49	?	N.W. & W.	4	2·8	2,71	2·73	961
		165	6	4· ·15	4·71 ·13	154·7 ·0	T	4·63 ·49	91 ·53	1·47 1·12	?16 ?04	S. & E.		2·64 ·21	2,17 ·52	2·56 ·49	·970 ..
		166	4	4·41 ·2·	5·3 ·23	152·3 ·0	T	4·45 ·17	1·10 ·35	1·7 ·65	? ?	E.S.E.		2· ·11	2,0 ·14	2·37 ·07	933 ..
	XLVI.	167	10	4·01 ·17	5·01 ·11	151· 1·2	T	4·63 ·39	91 ·35	1·74 1·00	?13 ·02	S.S.W.		2·18 ·4	1,72 ·91	2·14 ·14	9·3 ..
		168	1	3·9	5·0	151·2	T	4·4·	·6·	·60	?	E. & N.	1·	1·72	1,2	1·69	9·3
		169	10	3·74 0·	4· ·03	150· ·0	T	4·61 ·39	1·12 ·63	·87 1·35	?20 ?00	E.		1·84 5	1,444 261	1·8· ·35	1·027 ..
		170		3·61 ·01	4·73 ·01	150·0 ·0	T	4·10 ·61	·62 1·4	1· ·23	?16 ?	S.E. & S.	1	1· 15	1,12 ·5(	1· ·05	1·012 ..

MEAN VELOCITY-CURVES—ABSTRACT OF RESULTS

This Table is an Abstract of the Detailed Tables XLVII. to XLIX with additions

The upper line of each Series shows the "Mean Results"; the second line shows the "Ranges" of the Results.

SITES	1			2				3				4		6	7	8	
	Detailed Table	Serial No	Number of Sets	Gauge Reading	Hyd. Mean Depth	Surface Breadth	Rod Wood (W) Tin (T)	Surface Fall: Upper Sub Reach	Surface Fall: Middle Sub-Reach	Surface Fall: Lower Sub Reach	Surface Slope (Left & Both Banks)	Average Wind: Direction.	Average Wind: Velocity	Mean Velocity past centre vertical	Cubic Discharge	Mean Velocity	Ratio $V - U_0$
				h	R	b		F_1	F_2	F_3	S			U_0	D	V	c
SOLANI EMBANKMENT, MAIN SITE	XLVII.	171	3	3 62 10	4 72 08	150 0 0	T	3 60 04	24 00	00 10	?038 L ?	S	9	84 11	643 2 104 2	86 12	1 024 ..
		172	3	3 58 13	4·68 11	150 0 0	T	3 41 03	20 13	00 00	?	SSW	3	6 1.	483 3 65 9	66 07	985 ..
		173	5	3 47 05	3 86 04	150 0 0	T	4 29 10	41 02	09 05	088 L 010	E ⅆ S	3	1 36 11	820 . 58 3	1 35 09	993 .
		174	1	3 04	4 20	150 0	T	4 09	51	60	125 L	..	0	1 38	887 6	1 34	971
		175	5	2 90 05	4·07 04	150·0 0	T	5 03 05	1 17 05	1·40 00	215 L 000	W ⅆ N	2	1 6 05	1,14 34	1 79 07	1·072 ..
	XLVIII.	176	2	2 83 01	3 28 01	150 0 0	T	5 03 06	70 01	·30 00	?242 L ?163	E ⅆ N	6	1 64 00	839 9 5 6	1 65 00	1·006 ..
		177	4	2 42 16	3 64 15	150 0 0	T	5·02 12	1 08 17	1 15 32	?193 L ?015	E ⅆ N	9	1 40 14	852 116 4	1 50 16	1 071 ..
		178	2	2 43 25	3 64 22	150 0 0	T	4·36 55	32 10	18 15	?	SSE	4	7 0	407 24 9	81 10	1·080 ..
		179	4	1 92 16	3 18 15	150 0 0	T	5 19 01	1 07 11	88 05	?180 L ?	ENE	1	1 1 0	6?? 0 93 4	1 27 13	1 104 ..
		180	3	1·67 05	2 26 04	150 0 0	T	5 72 35	39 35	10 00	148 L 050	NW	1	98 06	300 28 3	87 06	888 ..
		181	1	3.	1 69	150 0	W * T	7 58	59	? 06	090 L	S	6	41	114 1	44	1 073
FIFTEENTH MILE Old Site New Site.	XLIX.	191	1	15 31	9 49	174 9	T	2 28	3 63	5 54	240 L	NE	2	4 5	7,18	4 16	914
		192	6	14 32 07	8 64 06	174 9 0	T	2 ?6 05	3 6. 08	4 87 10	231 L 033	N	1	4 25 70	6,19 60	3 98 39	936
		193	3	13 99 08	8 3. 07	174 9 0	T	2·30 08	3·60 08	4 73 05	227 L 007	NNW	2	4 0 11	5 780 114	3·87 04	9.6 .
		194	3	13 60 24	8 09 21	174 9 0	T	2 27 01	3 66 06	4 40 30	231 L 005	SW	1	4 1 00	5,62 179	3·93 01	942
		195	1	12 3	7 13	171·3	T	2·06	3·79	3·6.	?	N	1	3 60	4 370	3 .1	9.9
		196	3	15 16 10	8 67 08	185·9 3	T	2 26 07	3·6. 07	3·37 22	?221 L ?011	W	1	4 3 2	6,8. 115	4 12 03	947
		197	1	14 69	8·3.	184 2	T	2 1?	3 66	5 .0	220	SW	7	4 29	6,2.	3·98	928

* Wood Rods ¼ long Tin Rods of ½ and ¼ length

MEAN VELOCITY-CURVES—ABSTRACT OF RESULTS.

This Table is an Abstract of the Detailed Tables L to LV with additions

The upper line of each Series shows the Mean Results"; the second line shows the Ranges of the Results.

SITES	1			2				3			4		6	7	8		9
	Detailed Table	Serial No	Number of Sets	Gauge-Reading	Hyd Mean Depth.	Surface-Breadth	Rod Tin (T)	Surface-Fall: Upper Sub Reach	Surface-Fall: Lower Sub Reach	Surface-Fall: Surface-Slope (Both Banks)	Average Wind: Direction.	Average Wind: Velocity	Mean Velocity past centre vertical	Cubic Discharge	Mean Velocity	Ratio $V - U_o$	Silt Density (on centre vertical)
				A	R	b		F_1	F_2	S			U_o	D	V	c	σ
BEIRA.	L	201	5	7 44 25	9 02 26	188 4 2	T	? 70 ?	?3 98 ?	191 025	S	1	3 24 31	5,611 395	3 17 27	978 ..	?319 ?954
		202	7	7 03 26	8 72 23	188 0 ·3	T	? 82 ?	(3 70 ?	200 030	NNW	2	3 19 38	5,329 282	3 12 19	978 ..	600 2,918
		203	9	6 80 20	8 47 33	187 8 2	T	? 90 ? 63	?3 51 ? 31	?191 ?050	S	1	3 19 64	5,113 558	3·09 29	969 ..	436 948
	LI.	204	14	6 49 26	8·21 20	187 5 3	T	79 83	3 23 56	198 075	N	1	3 07 47	4,810 223	3 01 20	980 ..	304 1,203
		205	6	6 30 16	7 96 28	187 3 2	T	87 35	3 15 40	208 020	NW & N	1	3 10 26	4,766 108	3 07 04	990 ..	202 495
		206	12	5 84 30	7 60 31	186·8 3	T	·79 34	2 74 70	?200 ?030	N & E	1	2 99 64	4 29? 518	2 92 27	977 ..	601 5,185
JAOLI	LII.	211	9	7 21 25	7 82 27	192 8 3	T	39 23	?5 49 16	?174 ?032	NW & W	2	3 05 50	4 631 397	2 96 19	970 .	Not observed
		212	6	6 71 ·26	7 46 28	192 3 2	T	32 06	5 14 12	160 026	W & S	5	3 05 51	4,3o7 353	2 94 23	964 ..	
		213	7	6 45 26	7 22 38	192 0 2	T	29 12	4·80 96	?148 ?029	N & W	2	3 04 35	4,10o 286	2·87 21	944 ..	
		214	8	6 21 18	7 0o 16	191 8 1	T	28 09	4 70 66	146 030	WNW	3	2 94 44	3 92o 184	2 81 15	956 ..	
	LIII.	215	10	5 97 25	6 79 32	191 o 2	T	2o 23	4 53 1 09	145 03?	W & S	7	2 93 35	3 740 358	2 80 27	9o6 .	
		216	9	5 64 22	6 53 21	191 2 2	T	27 20	4 19 74	144 030	W & N	7	2 9 45	3,47o 362	2 7o 27	928 ..	
		217	6	5·36 21	6 32 17	190·9 2	T	21 05	3 76 77	140 011	WSW	6	2 84 24	3,2o 92	2 63 04	926 ..	
KAMBERA.	LIV.	221	4	6 46 22	4 84 17	65·5 2	T	2 83 08	11 80 21	20o 008	NNW	9	3·09 43	960 6 35 8	2·86 05	926 ..	Not observed
		222	15	6 07 23	4 50 34	65 2 1 4	T	2 97 30	11 54 23	291 041	N & W	6	2·94 51	871 0 96 8	2 82 22	959 ..	
		223	11	5 79 24	4 37 33	64 8 1 2	T	2 84 40	11 24 78	297 028	NNW	9	2 88 56	831 o 75 5	2 79 26	·969 ..	
	LV.	224	12	5·53 16	4 18 12	64·3 5	T	2 79 26	11 12 25	304 022	NNW	4	2 91 25	772 7 64 9	2·74 21	942 .	
		225	14	5·34 14	4·07 13	64·0 5	T	2 73 13	10 64 82	30? 01?	N & W	3	2 7? 54	739·4 65 5	2 71 16	978 ..	

TRIAL TRANSVERSE CURVES

Length of Base Transversal $= 2b$ from $y = -b$ to $y = +b$ Abscissæ (y) are reckoned of same sign as b so that $\frac{y}{b}$ is always +

The Table shows the values of the ordinates $\left(\frac{v}{v_0}\right)$ corresponding to the fractional abscissæ $\left(\frac{y}{b}\right)$

$\frac{y}{b}$	Parabolic $\frac{v}{v_0} = 1 - m\left(\frac{y}{b}\right)^n$ when $m = 1$								Elliptic $\left(\frac{v}{v_0}\right)^n + m\left(\frac{y}{b}\right)^n = 1$ when $m = 1$					EXPONENTIAL			
	$n = 1$	$n = \frac{2}{3}$	$n = 2$	$n = 3$	$n = 4$	$n = 5$	$n = 6$	$n = 8$	$n = 1$	$n = 2$	$n = 3$	$n = 4$	$n = 6$	Logarithmic	Error	Catenary	Equations
0	1·00	1·0000	1·0000	1·0000	1·0000	1·0000	1·0000	1·0000	1·00	1·000	1·000	1·000	1·000	1·0000	1·0000	1·0000	
1	90	9684	9900	9990	·9999	1·0000	1·0000	1·0000	90	·995	1·000	1·000	1·000	9048	9901	9950	
2	80	9106	9600	9920	9 84	9997	9999	1·0000	80	980	997	1·000	1·000	8187	9608	9799	
3	0	8357	·9100	9730	9919	9976	9993	9999	70	954	991	998	1·000	7408	9139	9546	
4	60	74 0	8400	·93(0	9744	9898	9959	9993	60	917	9 8	994	999	6703	·8521	9199	
5	50	6464	7500	8750	·9375	9687	9844	996	50	866	956	984	997	606$_5$	7788	·8724	
6	40	5351	6400	7840	8704	·9222	9533	9832	40	800	922	966	·99	5488	6977	8145	
7	30	4 43	5100	(570	7599	83 9	8824	9424	30	714	869	934	9 9	4966	6126	7448	
75	25	3505	4375	578	6836	627	8220	8999	25	661	833	909	968	4724	5698	70$_5$3	
8	20	2845	3600	4880	5904	6723	3 9	8322	20	600	787	877	951	4493	5273	6626	
85	15	2 63	2 75	3959	4 80	5563	6228	7275	15	527	728	832	924	4274	4855	6165	
9	10	1462	900	2710	3439	4095	4686	5695	10	436	647	766	881	4066	4449	5669	
95	·05	074	0975	1426	1855	2262	2649	3366	05	312	523	656	80	3867	·40$_5$6	5138	
96	04	0594	0784	1153	1507	1846	2172	2787	04	280	487	623	775	3829	3979	5027	
97	03	0447	0591	0873	1 47	14 3	1670	2162	03	243	444	582	42	3 91	3100	4915	
98	·02	·02)8	0396	0588	·07 6	096	1142	1492	02	191	389	528	696	3753	3040	4801	
99	01	·0 50	0199	0297	·0394	0490	0585	0772	01	41	310	446	623	3716	2981	4686	
1·00	00	0000	0000	·0000	·0000	0000	0000	0000	00	·000	000	000	000	367)	3679	4569	

Logarithmic curve $\frac{v}{v_0} = m\ \varepsilon^{-\eta}$ when $m = 1$

Error Curve $\frac{v}{v_0} = m\ \varepsilon^{-\eta^2}$ when $m = 1$

Catenary $\frac{v}{v_0} = m\left\{2 - \frac{1}{2}\left(\varepsilon^{\eta} + \varepsilon^{-\eta}\right)\right\}$ when $m = 1$

[Here η is printed for shortness for $\left(\frac{y}{b}\right)$]

CENTRAL SURFACE AND MEAN VELOCITIES—ABSTRACT OF RESULTS. ABSTRACT TABLE 20.

This Table is an Abstract from the Detailed Comparison Tables LVIII to LXI with the addition of Bazin s and Kutter's Co-efficients

Two lines are in general devoted to each Series. The upper line shows the "Mean Results" throughout; in Series of more than one Set the second line (old brevier type e.g. 137) shows the "Ranges

1		2							3						4							5							
SITE.	Serial No.	Number of Sets (Cols 2 to 6)	CONTROL					SURFACE FALL.		ROD-VELOCITY RESULTS					CENTRAL SURFACE-VELOCITY RESULTS.							SURFACE-SLOPE RESULTS							
			Head of Reach		Tail of Reach.																								
			Gates open in Dam	Ogees open in Dam	Gates closed in Regulator.	Withdrawn by Distributaries.	Average Obstruction on	Upper 5 miles	Lower 4½ miles	Hyd. Mean Depth	Surface-Breadth.	Length of Rod.	Direction.	Velocity.	Cubic Discharge in cub feet per sec.	MEAN VELOCITY	Number of Sets	Hyd Mean Depth	Direction	Velocity	Central Surface Velocity	Ratio $\frac{V}{v_o}$ Expnl	Ratio $\frac{V}{v_o}$ Bazin s Rule	Hyd Mean Depth	Direction.	Velocity	Surface Slope (L. or R. Bank)	Value of $100\sqrt{RS}$	Ratio $\frac{V}{v}$ Expnl	Ratio $\frac{V}{v}$ Bazin s	Ratio $\frac{V}{v}$ Kutter s
						Q	k	F_1	F_2	R	s	l			D	V		R			v_o	c	c_b	R			S	$\sqrt{}$	C	C_b	C_k
SOLANI LEFT AQUEDUCT	101	3	0 0	0	0	241 00	5 9[illegible]	5 49	7 94	82 2	9	SE b E 1		3,4[illegible]6	4 06								7 94	NE 1		189 L	3 88	1 048	1 11	1 050
			0 0	0	0	38 00	08	14	08	5	0			32	09								07			012	11	014	.	..
	103	4	0 0	0	0	1[illegible]3 00	5 91	5-0[illegible]	7 6[illegible]	82 5	8 9	SW b W 3		3,094	3 87			No Observations				..	7 64	SSW 4		207 L	3 98	973	1 11	1 041
			0 0	0	0	53 00	16	51	07	0	5			92	09								07			017	17	057	..	..
	105	2	0 0	0	0	73 00	5 90	4 64	7 19	84 1	8	W b N 2		2 70[illegible]	3 70								7 21	NW 1		222 L	4 00	926	1 10	1 032
			0 0	0	0	146 00	07	·20	09	1	0			152	16								05			007	07	024		
	106	3	0 [illegible]	0	0	57 ·00	5 86	4 29	6 81	85 0	7 5	SE 2		2,390	3 49	1	6 7[illegible]	N b E 4	4·05	847	786		6 81	SE 3		206 L	3 74	933	1 10	1 024
			0 2	0	0	113 00	11	19	15	0	0			137	11								15			32	34	055	..	..
	107	4	0 0	0	0	0 ·00	5 91	3·93	6 43	8[illegible] 0	7	SW b W 1		2,[illegible]13	3 46			No Observations				..	6 43	SSW 4		22[illegible] L	3 81	909	1 10	1 014
			0 0	0	0	0 00	03	06	05	0	0			47	06								·04			015	11	028		..
AQUEDUCT open.	108	10	0 [illegible]	0	0	233 ? 00	5 86	?[illegible]9	7 96	82 1	9 2	NE 1		3,429	4 06	7	7 97	ENE 1	4 52	884	805		7 96	SW 2		190 R	3 89	1 045	1 11	1 050
			0 2	0	0	208 ? 00	17	? 25	10	[illegible]	[illegible]			338	39		10		16	047	..		10			030	29	145	.	.
	109	1	0 0	0	0	318 00	6·07	5 2[illegible]	7 82	82 [illegible]	9	S b W 4		3 577	4 35	·	No Observations				..	7 80	Calm		198 R	3 93	1 107	1 11	1 046
	109	9	0 [illegible]	0	0	212 ? 00	5 86	5 26	7 76	82 5	9	NE b E 5		3 164	3 88	8	7 77	NE 2	4 44	874	799		7 76	E 3		192 R	3 86	1 006	1 11	1 046
			0 3	0	0	244 ? 00	34	62	10	0	0			312	34		10		41	060			10			018	19	056		..
	110	1	0 0	0	0	333 00	6·21	4 91	7 63	82 5	8 5	Calm.		3 385	4 24	1	7 66	V 1	4 78	887	809		7 67	V 1		203 R	3 95	1 073	1 11	1 042
	110	10	0 2	0	0	200 ? 00	5 87	5 23	7 62	82 8	9	SSW 1		3 049	3 8[illegible]	7	7 63	Calm	4 34	877	798		7 64	SW 3		193 R	3 84	1·001	1 11	1 043
			0 5	0	0	174 ? 00	33	25	07	7	5			285	27		20		23	053	..		20			020	16	091	.	
	110	1	0 0	0	0	0 00	5 75	5 10	7 58	83 1	9	V 7		2 838	3 61	1	7 58	Calm	4 39	822	793		7 58	Calm		183 R	3 73	968	1 11	1 044
	111	5	0 0	0	0	146 ? 00	5 91	4 87	7 43	83 6	8·3	NE b N 2		2 950	3 8	6	7 42	NW 1	4 40	880	801		7 43	NW 2		193 R	3 79	1 021	1 11	1 039
			0 0	0	0	305 ? 00	19	52	08	1	5			263	37		07		29	046	..		08			023	22	092		

SOLAVI RIGHT Left Aqueduct																											
112	3	0 0	0 0	0 0	148 298	7 00 7 00	5 94 09	4 58 33	7 13 17	84 1 2	8 0	NW 2	2 761 215	3 80 18	1	7 11	Calm	4 43	847	798	7 12 22	NW 1	204 R 027	3 8 23	999 101	1 10	1 031
113 114 115	6	0 0	1 6	0 0	102 261	7 00 7 00	5 90 30	4 20 20	6 70 25	84 4 1	7 3 5	SSE 1	2,529 222	3 73 26	4	6 73 14	Calm.	4 19 40	880 028	798	6 76 25	SE 1	205 R 033	3 72 34	1 001 101	1 10	1 023
116	5	0 0	0 0	0 0	57 287	18 92	5 95 15	3 71 1 05	6 40 11	84 5 0	7 0	SW *b* W 1	2 79 93	3 60 13	1	6 34	V *l*	4 03	890	796	6 40 11	S 1	207 R 010	3 65 08	·989 057	1 10	1 014
117	2	0 0	0 0	0 0	215 128	7 00 7 00	6 06 12	3 19 1 18	6 14 02	85 0 0	6 3 5	NE *b* N 2	2 209 73	3 6 13	2	6 14 06	NE *b* E 1	4 02 04	912 023	798	6 15 08	N 2	290 R 021	3 68 15	998 005	1 10	1 008
118	4	0 0	0 0	0 0	120 212	7 47 7 00	6 00 12	3 29 49	5 86 16	85 0 0	6 0	NNE 3	2 0 8 155	3 61 17	4	5 86 17	S 1	4 06 32	890 054	797	5 86 17	V *l*	225 R 015	3 63 17	994 042	1 10	1 000
119	6	2½ 12	1½ 10	0 0	95 234	7 55 7 83	6 46 49	2 5 1 12	5 43 23	85 0 0	5 4 5	NNE 1	1 999 113	3 69 23	5	5 45 23	V *l*	4 21 171	878 064	805	5 44 23	N 1	234 R 093	3 55 72	1·046 232	1 09 ••	987
119	1	0	0	0	0	00	6 97	2 93	5 41	85 0	5 5	Calm.	2 107	4 04	No Observations						5 32	Calm	313 R	4 08	990	1 09	981
121	2	0 0	0 0	0 0	117 234	1 08 7	6 25 15	2 31 1 55	5 00 04	85 0 0	5 0	S 2	1 633 12	3 43 06	2	5 01 02	Calm	3 90 14	880 016	800	5 01 02	Calm	240 R 120	3 44 86	1 012 236	1 08	975
122	3	0 0	0 0	0 0	23 2	67 00	5 66 03	1 72 05	4 05 04	85 0 0	4 0	S *b* W 7	10?	2 73 02	2	4 04 02	SW *b* S 4	3 05 05	900 014	789	4 06 06	V *l*	205 R 023	2 88 14	949 039	1 06	941
122	3	5 15	3½ 10	6½ 10	58 173	7 00 7 00	6 43 82	7 19 7 50	4 00 08	85 0 0	3 8 5	ENE 2	1 223 23	3 26 06	3	4 03 12	E *b* N 1	3 75 07	870 004	795	4·02 06	N 2	278 R 037	3 33 45	982 111	1 06	939
124	1	8	0	8	0	?	6 61	1 29	3 26	85 0	3	N 5	722 2	2 43	1	3 34	Calm	2 90	838	788	3 42	Calm	195 R	2 58	949	1 05	913
125	1	3	0	10	0	00	7 78	42	1 95	85 0	1 5	S *l*	276 0	1 61	1	1 98	S *l*	1 85	880	760	2·00	Calm	203 R	2·01	801	98	818
127	1	10	0	10	0	50	7 40	7 00	60	84 3	5	S 10	356	60	No Observations						74	S 11	113 R	·91	660	81	616
SOLAVI RIGHT AQUEDUCT Left Aqueduct closed.																											
131	2	0 0	0 0	0 0	247 0	4 30 7 00	3 60 00	10 00	4 20 00	85 0 0	4 0	NE 2	481 9 19 5	1 24 05	2	4 19 03	NE 3	1 48 11	838 028	827	4 17 07	NE 3	025 R 002	1·02 04	1 211 002	1 06	1 140
132	2	0 0	0 0	6 0	159 0	? ?	6 17 00	9 00	3 65 04	85 0 0	3 0	Calm.	1 623 51	4 8 09	2	3 68 03	Calm	5 74 11	849 001	820	3 68 03	Calm	473 R 015	4 17 08	1 157 000	1 05	1 033
135	1	0	0	8	71	1 33	6 22	6	2 93	85 0	2 5	Calm	865 0	3 20	1	3 03	Calm	3 60	889	820	3 04	Calm	253 R	2 77	1 155	1 04	1 051
136	1	0	0	8	71	1 33	6 28	69	2 94	85 0	2 5	Calm	740 2	2 9	1	2 95	Calm	3 44	811	817	2 99	Calm	208 R	2 46	1 134	1 04	1 044
137	1	0	0	8	78	?	6 4	43	2 94	85 0	3	SW 6	667 8	2 5	1	2 89	Calm	3 19	787	806	2·85	Calm	200 R	2 39	1 050	1 03	1 039
138	1	0	0	8	78	?	6 52	18	2 72	85 0	2	Calm	690 7	2 54	1	2 68	Calm.	2 88	·682	837	2 61	Calm	145 R	1 95	1·303	1 02	1 020
139	2	0 0	0 0	8 0	50 0	1 21 00	5 0 11	16 11	2 52 10	85 0 0	2 0	S 1	490·3 58 6	2 20 1	2	2 59 09	S *b* W 3	2 54 25	863 018	81	2 53 12	V *l*	151 R 035	1 95 28	1 132 069	1 01	1 014

ABSTRACT TABLE 21.

CENTRAL SURFACE AND MEAN VELOCITIES—ABSTRACT OF RESULTS

This Table is an Abstract from the Detailed Comparison Tables LXII to LXIV with the addition of Bazin's and Kutter's Co-efficients

Two lines are in general devoted to each Series The upper line shows the Mean Results throughout In Series of more than one Set the second line (old brevier type, as 182) shows the "Ranges"

SITE	1		2							3					4						5						
			CONTROL.				SURFACE FALL.			ROD-VELOCITY RESULTS					CENTRAL SURFACE-VELOCITY RESULTS						SURFACE-SLOPE RESULTS						
	Serial No	Number of Sets (Cols 2 3)	Head of Reach: Gates open in Dam	Gates open in Dam	Gates closed in Regulator	Tail of Reach: Withdrawn by Tributaries Q	Average Obstruction A	Upper 4 miles F_1	1 mile below Site F_2	Lower 4½ miles F_3	Hyd. Mean Depth R	Surface-Breadth b	Average Wind: Direction	Velocity	Cubic Discharge D	Mean Velocity V	Number of Sets	Hyd. Mean Depth R	Average Wind: Direction	Velocity	Central Surface Velocity v_o	Ratio $V \div v_o$: Exper'l C	Bazin's Rule C_b	Hyd. Mean Depth R	Average Wind: Direction	Velocity	Surface-Slope (Left Bank) S	Value of $100\sqrt{RS}$ v	Ratio $V \div v$: Exper'l C	Bazin's C_b	Kutter's C_k
SOLANI EMBANKMENT MAIN SITE High Water	151	5	0	0	0	268	·00	4 70	1 20	5 46	9 34	170·0	ESE	4	7 169	4 02	2	9·30	SE	3	4 66	·881	775	9·34	ESE	5	227	4 60	·872	907	877
			0	0	0	2	·00	09	10	20	07	1·2			424	20					09	013		09			007	09	047	•	•
	152	10	0	2	0	226	? 00	4 79	1 15	5 58	9 19	170 6	SSE	4	6 743	3 83	10	9 20	ESE	3	4 52	849	777	9 20	Calm.		20·3	4 34	884	905	877
			0	1	0	162	? 00	13	18	30	10	1 2			545	26					29	067		15			020	21	084	••	••
	153	5	0	2	0	149	? 00	4 72	1 20	5 13	8 94	168 7	W b S	4	6 712	3 68	4	8·94	W b S	6	4 30	8·8	764	8 92	W	4	207	4 50	821	901	871
			0	2	0	183	? 00	21	15	72	12	0			132	05		12			50	102	•	10			069	59	120		••
	154	3	0	0	0	206	00	4 68	1 29	4 84	8·69	167 1	SW b S	2	5 974	3 71	2	8 71	S	3	4 47	833	767	8 69	V	2	229	4 46	83·9	897	868
			0	0	0	182	00	10	02	12	13	1 2			425	18		13			23	002		13			038	40	045	••	••
	155	6	0	0	0	104	00	4 72	1·06	4 6·3	8 49	166 3	W	5	5 564	3 5	5	8 46	W	5	4 21	8·6	767	8 44	W	5	217	4 28	83·3	893	864
			0	0	0	240	00	40	14	30	·24	0			1,141	63		05			8·9	075		18			049	52	072	••	••
	156	1	0	0	0	22	? 00	3 91	2·06	3 9	8 2·3	16·3 2	E	4	4 930	3 26	1	8 2·3	Calm		3 94	827	750	8 2·3	Calm		223	4 29	7·0	889	861
	157	4	0	1	0	34	00	4 63	1 9·3	4 30	8·09	164·0	SE b S	1	4 810	3 31	4	8 09	SE	1	4 02	82·3	760	8 01	SE	2	212	4 19	804	885	858
			0	2	0	113	00	06	·05	19	16	0			476	·6		16			21	061	•	16			028	28	082	••	••
	158	2	0	0	0	196	? 00	4 81	1 9·3	4 2·3	7 84	164 0	W	3	4 861	3 4	2	7 79	Calm.		4 25	806	768	7 79	Calm		215	4 10	837	881	853
			0	0	0	3	? 00	15	15	25	03	·0			65	01		04			10	016		03			000	01	005		•

SOLANI EMBANKMENT MAIN SITE

High Water	159	7	1 1	0 0	0 0	89 219	7 00 7 00	4 86 1 02	1 25 19	3 9. 15	7 65 09	162 6 1 1	SSW	1	4 608 325	3 29 21	3	7 67 12	Calm		4 15 04	814 010	762 ..	7 66 14	SW b W	2	243 010	4 05 08	812 048	878 ..	849 ..
	160	6	0 0	0 0	0 0	18 62	00 00	4 67 18	1 32 07	3 51 22	7 26 18	161 3 1 2	W b S	4	4,120 90	3 22 10	2	7 28 13	W	4	3 64 15	890 012	763 ..	7 26 14	W	6	214 010	3 94 10	817 044	870 ..	843 ..
	161	5	0 0	0 0	0 0	9 22	00 00	4 63 05	1 30 05	3·30 50	7 12 12	150 3 0	S b E	4	3,863 155	3 11 12	1	7 14	Calm		3 69	851	758	7 12 ·12	SSE	2	217 006	3 93 06	792 022	867 ..	841 ..
	162	5	0 0	0 0	0 0	12 22	7 00 7 00	5 10 33	1 14 17	3 1. 30	6 78 22	150 3 0	SE b E	2	3 973 342	3 39 37	5	6 80 20	S	1	4 01 86	847 093	779 ..	6 79 21	S	2	221 125	3 85 1 11	893 302	859 ..	833 ..
	163	0	0 0	0 0	0 0	0 0	? ?	5 11 10	1 23 01	2 62 14	6 18 12	157 0 0	WSW	2	3,194 237	3 05 20	6	6 19 11	N b E	1	3 60 16	849 076	788 ..	6 19 10	Calm		171 050	3 25 45	943 158	844 ..	824 ..
	165	4	0 0	0 0	0 0	214 0	? ?	4 77 28	85 24	1 2 10	5 72 13	154 7 0	NE b N	1	2,371 264	2 51 24	4	5 72 13	Calm		2 94 22	859 053	765 ..	5 72 13	Calm		161 040	3 04 39	824 065	830 ..	813 ..
	166	1	0	0	0	172	?	4 87	88	1 35	5 30	152 3	E	6	2,100	2 40	1	5 40	Calm		2 81	854	766	5 40	Calm		155	2 89	830	820	804
Low Water	167	2	0 0	0 0	0 0	77 121	7 50 ?	4·68 05	90 30	1 50 40	5 03 05	151·8 1 1	SE b S	2	1,723 73	2 13 14	2	5 03 06	Calm		2 36 00	903 059	727 ..	5 03 06	Calm		195 020	3 13 18	676 072	807 ..	665 ..
	169	2	0 0	0 0	0 0	60 1	? ?	4 69 04	1 21 56	·70 60	4 83 03	150 0 0	Calm		1,445 49	1 89 ·05	2	4 83 03	Calm		2 03 06	929 052	714 ..	4 83 02	Calm		200 000	3 11 00	607 015	799 ..	659 ..
	170	1	0	0	0	136	?	4 40	70	·60	4 72	150 0	Calm		1,152	1 54	1	4 75	V	1	1 82	846	685	4 76	Calm		165	2 80	550	797	657
	171	1	0	0	0	263	74 10	3 66	24	10	4 76	150 0	S	11	704 9	95	1	4 76	SSE	4	92	1 011	731	4 76	SE	5	038	1 35	689	797	·679
	173	5	0 0	0 0	6 0	232 0	2 08 00	4 29 ·10	41 02	·09 05	3 86 04	150 0 0	E b S	3	820 5 58 3	1 35 03	4	3 86 03	E	2	1 54 04	874 049	·743 ..	3 87 04	Calm.		088 010	1 84 11	734 ·052	757 ..	631 ..
	174	1	0	0	0	106	?	4 59	51	60	4 20	150·0	Calm		687 6	1 34	1	4 33	Calm		1 52	882	694	4 34	Calm		125	2 33	575	779	647
	175	1	0	0	0	0	?	5·06	1 14	1 40	4 05	150·0	Calm.		1,155	1 82	1	4 03	Calm		1 86	978	709	4 03	Calm		215	2 94	618	765	633
	176	2	44 3	0 0	8 0	104 10	1 76 66	5 03 06	·70 01	30 00	3 28 ·01	150 0 0	F b N	6	839 9 5 6	1 65 00	1	3 26	NW	3	1 79	922	708	3 28 01	E	4	?242 ?163	?2 78 ? 03	? 613 ? 215	724 ..	·604 ..
	177	3	0 0	0 0	0 0	0 0	? ?	5·01 ·11	1·06 17	1 17 ·32	3 62 ·15	150 0 0	E b N	9	835·5 77 7	1 48 09	3	3 62 15	NE	1	1 55 11	·953 049	688 ..	3·62 16	E	1	193 015	2 65 16	558 023	744 ..	·618 ..
	179	1	0	0	0	0	?	5 18	1·02	90	3·11	150 0	Calm		583 7	1 21	1	3 11	Calm		1 26	961	668	3 11	Calm.		180	2 37	·511	713	596
	180	2	0 0	0 0	9 0	19 4	1 24 00	5 72 35	39 33	10 00	2 26 04	150 0 0	NW	1	300 9 28 3	8, 06	2	2 24 00	E	1	91 15	965 094	654 ..	2 25 01	NW	1	148 005	1 82 04	478 022	646 ..	547 ..
	181	1	13	0	10	0	67	7 58	·59	? 0	1 69	150·0	S	6	114 1	44	.	No Observations					..	1 73	S	11	090	1 25	352	591	501

CENTRAL SURFACE AND MEAN VELOCITIES—ABSTRACT OF RESULTS

This Table is an Abstract from the Detailed Comparison Tables LXV to LXIX. with the addition of Bazin's and Kutter's Co-efficients

Two lines are in general devoted to each Series. The upper line shows the Mean Results throughout; in Series of more than one set the second line (old brevier type as 103) shows the "Ranges."

[Lengths of Sub Reaches as follows (in miles):—Fifteenth Mile Sites 2, 3, 4½ Behrs, 1 4; Jaolí 1 5 Kamhera, 2½ 8½]

1			2									3					4						5							
			Control					Surface Fall				Rod Velocity Results					Central Surface-Velocity Results						Surface-Slope Results							
			Head of Reach		Tail of Reach																									
Sites	Serial No	Number of Sets (Cols 3, 5)	Gates open in Dam	Gates closed in Regulator	Withdrawn by Distributaries	Average Obstruction on		Upper Sub-Reach	Middle Sub-Reach	Lower Sub-Reach		Hyd Mean Depth	Surface-Breadth	Average Wind			Number of Sets	Hyd Mean Depth	Average Wind		Central Surface Velocity	Ratio $\frac{V}{v_o}$ Expert	Ratio $\frac{V}{v_o}$ Bazin's Rule	Hyd Mean Depth	Average Wind		Surface Slope (L. or R. Bank)	Value of $100\sqrt{RS}$	Ratio $\frac{V}{w}$ Expert	Ratio $\frac{V}{w}$ Bazin's	Ratio $\frac{V}{w}$ Kutter's
			Ogees open in Dam											Direction	Velocity	Discharge in cub feet per sec.			Direction	Velocity											
					Q	k		F_1	F_2	F_3		R	s			D	V		R			v_o	C	C_b				S	w	C	C_b	C_k
Fifteenth Mile Old Site	191	1	0	0	0	123	00	2 28	3 63	5 54		9 49	174 9	NE	2	7 187	4 16	1	9 48	NW	1	4 91	·847	775	9 51	NW	1	240	4 77	872	910	878
	192	6	0	0	0	44	00	2 26	3 60	4 87		8 64	174 9	N	1	6,199	3 98	6	8 64	N	1	4 60	866	779	8 60	N	1	231	4 47	893	896	867
			0	0	0	115	00	03	08	10		06	0			602	39		06			17	·088	..	·06			033	32	107	.	..
	193	3	0	0	0	80	00	2 30	3 60	4 73		8 30	174 9	NNW	2	5 786	3 87	3	8 36	S	2	4 51	857	778	8 34	N	3	227	4 36	887	·891	862
			0	0	0	126	00	08	08	05		07	0			114	04		08			13	19	.	03			007	05	·012	..	..
	194	2	0	0	0	0	00	2·27	3 66	4 40		8·02	174 9	SW	1	5 622	3 93	2	8 01	Calm		4 61	871	783	8 02	SW	2	231	4 31	912	885	857
			0	0	0	0	00	01	06	30		21	0			179	01		22			11	014	.	23			005	01	000	.	..
	195	1	0	0	0	62	00	2 06	3 73	3 60		7 13	171 3	N	1	4,370	3 51	1	7 15	Calm		4·21	834	?	No Observations						.	..
New Site	196	3	0	0	0	268	00	2 26	3 65	5 37		8 67	185 9	W	1	6 857	4 12	3	8 67	SW	1	4 69	880	788	8 68	W	1	?221	?4 38	? 942	897	953
			0	0	0	0	00	07	07	22		08	3			115	03		04			16	026	..	09			?011	? 10	? 028	.	..
	197	1	0	0	?	115	00	2 19	3 66	5 20		8 30	184 2	SW	7	6 287	3 98	1	8 37	SW	7	4 52	881	786	8 30	SW	7	220	4 29	928	891	943
	201	5	Head		Head.	169	00	? 70	Reach	?3 98		9 02	188 4	S	1	5 611	3 17	4	9·02	S	1	3 67	809	751	9 02	S	1	191	4 15	763	902	747
						230	00	? 05		? 15		26	2			398	27		24			14	053		26			025	28	047	..	..
	202	7				188	00	? 82		?3 70		8 72	188 0	NW	2	5 529	3 12	7	8 73	NW	3	3 70	846	747	8 72	N & W	3	200	4 17	749	898	741
						298	00	? 32		? 22		23	3			282	19		20			26	040		23			030	27	032	..	..

BEL	203	9	No Dam at	No Regulator at	142 298	00 00	290 263	No middle Sub-	23 51 2 31	8 47 33	187 8 3	S	1	5,112 558	3 09 29	8	8 49 34	S	1	3 56 35	876 095	753	8 47 33	S	1	2101 2050	24 01 2 50	2 771 2 064	803	738 •
	204	14			124 280	09 09	79 83		3 23 56	8 21 20	187 5 3	N	7	4 810 223	3 01 20	13	8 20 18	N	7	3 47 27	868 081	74 •	8 21 20	N	7	108 075 Both	4 03 72	747 121	889	733
	205	6			254 16	03 47	87 35		3 15 40	7 96 23	187 3 2	NW b N	1	4 766 108	3·07 04	6	7 96 28	NNW	1	3 53 16	870 043	748 ••	7 96 28	NW b N	1	208 020	4 07 18	754 037	884	728 ••
	206	12			183 108	19 56	79 34		2 74 70	7 60 31	186 8 3	N b E	1	4,292 518	2 92 27	12	7 59 31	N b W	1	3 39 20	862 075	74 •	7 60 31	N b E	1	2200 2030	23 90 2 37	2 749 2 087	877	723 ••
JAOLI	211	9	No Dam at Head	No Regulator at Head	53 75	2 00 2 00	·39 23	No middle Sub-Reach	2·4 2 16	7 82 27	192 8 3	NW b W	2	4 631 397	2 96 19	9	7 82 30	WNW	2	3 43 25	861 063	760	7 82 27	NW b W	2	2174 2032	23 69 2 35	2 802 2 058	881	859 ••
	212	6			43 90	00 00	30 06		5 14 12	7·46 28	192·3 2	W b S	5	4 357 353	2 94 23	6	7 46 24	W b N	5	3 32 24	886 088	771	7 46 28	W b S	5	160 026	3 44 29	853 040	874 •	854 •
	213	7			52 100	29 1 00	29 19		4 80 96	7 22 38	192·0 2	N b W	2	4 105 286	2 87 21	7	7 23 38	NNE	2	3 36 18	857 089	776	7 22 38	N b W	1	2148 2029	23 27 2 28	2 878 2 035	869	851 •
	214	8			35 80	00 00	28 09		4 70 66	7 05 16	191 8 1	WNW	9	3 929 184	2 8 15	8	7 04 13	W	7	3 27 22	860 086	776	7·05 16	WNW	9	146 030	3 21 33	878 065	865	848
	215	10			47 90	20 1 00	25 23		4 53 1 09	6 79 32	191 5 2	W b S	7	3 740 358	2 80 27	10	6 79 29	W b N	5	3 21 27	871 091	779 •	6 79 32	W b S	7	140 037 Both	3 14 44	802 072	859 ••	842 ••
	216	9			44 95	44 1 00	27 20		4 19 74	6 53 21	191 2 2	W b N	7	3 473 362	2 70 27	9	6 53 21	WSW	9	3 14 18	863 100	777	6 53 21	W b N	7	144 030	3 06 30	883 086	852 ••	836 ••
	217	6			16 95	67 1 00	21 05		3 76 77	6 32 17	190 9 2	WSW	6	3 259 92	2 63 04	6	6 33 17	W b N	7	3 09 16	850 038	778 •	6 32 17	WSW	6	140 011	2 97 12	886 035	847 ••	832 ••
KAMHERA	221	4	No Dam at Head	2 closed, 1 open	101 3	1 26 00	2 83 08	No middle Sub Reach	11 80 21	4 84 17	65 5 2	NNW	9	960 6 35 8	2 86 05	4	4 84 17	NNW	9	3 40 28	842 067	749 •	4 84 17	NNW	9	297 008	3 78 04	757 017	800	781 ••
	222	15			93 18	1 26 00	2 97 30		11 54 23	4 50 34	65 2 1 4	N b W	6	871 0 96 8	2 82 22	15	4 50 34	N b W	5	3 32 40	848 074	755	4 50 34	N b W	6	291 041	3 62 16	779 068	786 ••	771 ••
	223	11			73 65	1 26 00	2 84 40		11 24 78	4 37 33	64 8 1 2	NNW	9	831 5 75 5	2 79 26	11	4 36 33	NNW	9	3 25 48	860 115	754 •	4 37 33	NNW	9	297 028 Both	3·60 12	776 079	781 •	767 ••
	224	12			57 88	1 26 00	2 79 26		11 12 25	4 18 12	64 3 5	NNW	4	772 7 64 9	2 74 21	12	4 18 12	NNW	5	3 17 44	865 112	752 ••	4 18 12	NNW	4	304 022	3 56 10	769 045	772 ••	·776 ••
	225	14			69 62	1 26 00	2·73 13		10 64 82	4 07 13	64·0 5	N b W	3	739 4 65 5	2 71 16	14	4 07 13	N b W	3	3 10 30	·875 081	750 ••	4 07 13	N b W	3	306 019	3 53 09	760 ·045	767 ••	773 ••

ABSTRACT TABLE 23.

CUBIC DISCHARGE TABLE.

This Table shows the Cubic Discharge in the Roorkee, Belra, and Kamhera Reaches (for each half foot of the Standard Gauge* of the Reach) and also in the four Distributaries (a few cases only),—1°, according to the Results of these Experiments and 2°, to the official Canal Tables in use at the time.

* The 'Standard Gauges' are those used for the Canal Tables; their positions are shown in Plates I III IV.

Roorkee Reach.			Belra Reach			Kamhera Reach			Distributaries			
Solání Aqueduct Gauge	Solání Embankment Main Site. (Present Experiments)	Solání Aqueduct Site. (Canal Tables)	Belra Gauge.	Belra Site. (Present Experiments)	Belra Site (Canal Tables)	Kambera Bridge Gauge.	Kambera Discharge Site (Present Experiments)	Kambera Bridge Site (Canal Tables)	Name.	Gauge-Reading	Experimental Site, see Plate III. (Present Experiments)	Sites near Gauges (Canal Tables)
·5	?	119	5	No Experiments.	221	·5	No Experiments.	..	Right Aoli.	3 1	98	105
1 0	123	236	1 0		443	1 0		..		4 3	191	166
1 5	?	440	1 5		665	1 5		Nil				
2 0	625— 260	642	2 0		887	2 0		12				
2 5	850— 327	926	2 5		1,297	2 5		43	Mansúrpur	3 6	73	60
3 0	1,180— 420	1,211	3 0		1,707	3 0		91		3 9	83	69
3 5	865— 490	1,495	3 5		2 117	3 5		155		4 1	91	75
4 0	1,520—1,080	1,780	4 0		2,525	4 0		231				
4 5	2,060— 480	2,105	4 5		2,787	4 5		318				
5 0	2,340	2,430	5 0		3 050	5 0		416	Miránpur.	2 8	25	22
5 5	3,190	2,755	5 5		3,350	5 5		525		3 8	41	44
6 0	3,584	3,105	6 0	4,410	3,700	6 0	690	643				
6 5	4,020	3,455	6 5	4,810	4,143	6 5	770	769	Pimora.	3 3	50	48
7 0	4,170	3,805	7 0	5,325	4,590	7 0	860	903		3 8	63	57
7 5	4,880—4,460	4,155	7 5	5,655	5,033	7 5	970	1,044				
8 0	4,830	4,530	8 0	?	5,478	..	..	..				
8 5	5,470	4,905	..	..	..	..	..	..	..	..	..	..
9 0	6,010	5,305	..	..	..	..	..	..	..	..	..	..
9 5	6 300	5,705	..	..	..	..	..	..	..	..	..	..
10 0	7,270—6 770	6,105	..	..	..	..	..	..	..	..	..	..

ABSTRACT TABLE 24.

CUBIC DISCHARGE-VERIFICATION.

Range of Mean Velocities in each Series.

This Table shows the highest Mean Velocity and corresponding Gauge-Reading in every Series, and also the (actual and percentage) Range of Mean Velocity and Range of Gauge-Reading corresponding

SITES	Serial No	Number of Sets	Depth: Gauge of max V (ft)	Depth: Range (max to min V)	Mean Velocity: Maximum V	Mean Velocity: Range: Actual	Mean Velocity: Range: Percent (of max)
SOLANI LEFT AQUEDUCT	101	3	9 83	17	4 12	09	2 2
	102	12	9 00	00	3 73	26	7 0
	103	4	9·40	03	3 91	09	2 3
	104	12	9·15	25	3 69	16	4 3
	105	2	8 67	13	3 78	16	4 2
	106	6	8 19	22	3 54	20	5 7
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	113	1	.	..	..	..	..
	114	20	7 95	00	3 76	..	..
SOLANI RIGHT AQUEDUCT (Left Aqueduct open)	119	7	6 13	17	4 04	48	11 9
	120	9	5 75	11	3 46	34	9 8
	121	2	5 58	05	3 46	·06	1 7
	122	13	4 35	14	3 35	66	19 7
	123	1	..	..	..	..	..
	124	1	..	..	..	..	..
	125	1	..	..	..	..	..
	126	1	..	..	..	..	..
	127	1	..	..	..	..	..
[L Aqueduct closed]	131	2	4·00	00	1 26	·05	4 0
	132	2	3 98	05	4 87	09	1 9
	133	1	..	..	..	..	..
	134	1	..	..	..	..	..
	135	1	..	..	..	.	..
	136	1	..	..	..	..	..
	137	1	..	..	..	..	..
	138	1	..	..	..	..	..
	139	2	2 71	11	2 28	17	7 5

SITE	Serial No	Number of Sets	Depth: Gauge of max V (ft)	Depth: Range (max to min V)	Mean Velocity: Maximum V	Mean Velocity: Range: Actual	Mean Velocity: Range: Percent (of max)
			High Water				
	155	6	8 8	29	4·05	63	15 6
	Low Water.						
SOLANI EMBANKME	167	10	3 98	·10	2 20	·14	6 4
	168	1	..	..	..	..	..
	169	10	3 75	03	2 13	35	16 4
	170	2	3 63	01	1 54	08	5 2
	171						
	172						
	173						
	174						
	175						
	176	2	2 83	01	1 6[illegible]	00	0
	177	4	2 47	14	1 58	16	10 1
	178	2	2·30	25	·86	·10	11 7
	179	4	2·00	15	1·34	13	9·7
	180	2	1 69	05	·90	06	6 7
	181	1	..	..	..	..	..

SITE	Serial No.	Number of Sets	Depth: Gauge of max V (ft)	Depth: Range (max to min V)	Mean Velocity: Maximum V	Mean Velocity: Range: Actual	Mean Velocity: Range: Percent (of max)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	197	1	..	..	..	..	..
JAOLI	211	9	7 28	·21	3 06	19	6 2
	212	6	6 68	08	3 05	23	7 5
	213	7	6 30	04	2·98	21	7 1
	214	8	6 26	06	2 89	·15	5 2
	215	10	5 96	·11	2 95	·27	9 2
	216	9	5 74	·09	2 84	27	9 5
	217	6	5 41	01	2 64	04	1 5
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DISTRIBUTARIES	231	2	4 34	01	2 52	01	·4
	232	2	3 10	·01	1 10	·00	0
	233	4	4 05	20	2 14	11	5 1
	234	1	..	..	..	..	..
	235	1	..	..	..	..	..
	236	2	2 83	00	1 49	00	0
	237	2	3·78	·01	1 84	02	1 1
	238	2	3·37	09	1 79	08	4·5

ABSTRACT TABLE 25.

CUBIC DISCHARGE-VERIFICATION.

Cases of High Mean Velocity Range (over 10 per cent) in a Series.

The cases of high mean velocity are shown to left; followed by all cases of mean velocity = or < $\frac{9}{10}$ of the high value (in same Series). The External Conditions affecting them follow

Sites	Serial No	Date or Number of Set.	Mean Velocity: High V	Mean Velocity: $\frac{9}{10}$ of high V [computed]	Mean Velocity: Number of cases = or < 9 × high V	Mean Velocity: Low V	Depth: Gauge-Reading. Π or h	Depth: Variation.	Length of Rod. l	Surface Fall: Upper Sub-Reach. F_1	Surface Fall: Middle Sub-Reach. F_2	Surface Fall: Lower Sub-Reach. F_3	Surface-Slope. S	Wind: From: Direction.	Wind: From: Velocity	Wind: To: Direction.	Wind: To: Velocity	Probable Causes of high velocity.	Probable Causes of uncertain results.
RIGHT AQUEDUCT.	108	14-12 '78	4 30	3 87	2	..	9 98	00	9	5 97	No Middle Sub-Reach.	5 55	175	S	9	?	?	Short Rod, high F_1	
		1-6-'77	..	..	..	3 84	10 00	00	9½	5 90		5 70	?	SE	3	E	11	.. ..	High wind.
		8 6- „	..	..	..	3 85	9 97	+ 01	9½	5 73		5 62	?	W	4	S	7	.. ..	
	109	23-7-'78	4 35	3 91	11	..	9 68	+ 05	9	6 07		5 23	198	..	0	S ¼ W	8	High F_1	
		Nos. 2 to 4, & 10 to 17 — Max. data of 11,				3 89	65	·12	9	5 94		5 43	?195	NE	12	N	18	.. ..	
		Min. data of 11,				3 74	50	00	9	5 73		4 95	?185	..	0	..	0	.. ..	
	109	14-11-'77	4 28	3 85	4	..	9 64	+ 02	9	6 16		5 14	?	S	4	S	5	High F_1	
		Nos 3, 4, 14, 17 — Max. data of 4,				3 84	65	·03	9	5 85		5 40	195	NE	12	NE	17	.. ..	
		„ „ „ Min. data of 4,				3 74	50	00	9	5 80		4 95	190	..	0	..	0	.. ..	
	109	14-11-'77	4 17	3 75	1	..	9 66	+·02	9	6 14		5 16	?	S	5	SSW	13	High F_1	High wind.
		3 5- „	..	..	..	3 74	65	00	9	5 80		4 95	190	NE	12	N	10	.. ..	High wind.
	110	8 8-'78	4 24	3 82	13	..	9 39	−·03	8¼	6 21		4 94	202	..	0	..	0	Short Rod, high F_1	
		Nos 1, 3, 4, 6, 11 & 13 to 20 — Max. data of 13,				3 82	·42	03	9	6 11		5 27	?200	NE	10	N	13	.. ..	
		Min. data of 13,				3 61	25	·00	8¼	5 75		5 10	?182	..	0	..	0	.. ..	
	110	28 5-'78	4 02	3 62	1	..	9 42	·00	9	5 98		5 12	186	NW	1	V	7	High F_1	
		26-4-'77	..	..	..	3 61	25	·00	9	5 75		5 10	182	..	0	N	13	.. ..	High wind.

119	9 7 '78	4 04	3 64	2	.	6 13	+ 25	5½	6 97	No Middle Sub Reach	2 93	313	.	0	..	0	Short Rod, high F_1 S				Canal not in train
	10 7- „	..	..	.	3 63	11	+ 15	5½	6 79		2 41	273	N	6	V	15	..	..	..	..	Water rose 15
	25-7-'76	..	..	..	3 56	30	00	6	6 40		3 10	240	..	0	..	0	..	..	..	..	
122	23 8 '78	3 35	3 02	10	..	4 35	+ 05	3½	6 05		1 95	260	..	0	N	5	Short Rod high F_1 F_2 S ?				
	22 7- 76	3 30	2 97	10	..	33	00	4	6 67		1 73	330	S	6	SE	4	High F_1, (and S ?)				
	23-8 '78	3 24	2 92	10	..	43	+ 05	4	6 37		2 23	243	N	7	E	8	High F_1, (and S ?)				
	Nos. 1 to 10	Max data of 10			2 88	57	05	4	5 68		1 79	?215	S	9	S	19	..	..	..	..	
	„ „ „	Min data of 10,			2 69	40	00	4	5 61		1 70	?190	..	0	..	0	..	..	..	..	
155	28 10 '78	4 05	3 65	5	..	8 82	·00	Longest possible in each Float-Course.	5 01		1 34	4 45	248	..	0	..	0	High F_1, F_2, S	..	..	Change of soundings?
	Nos 1 & 3 to 6	Max data of 5			3 58	82	21		4 70		1 29	4 75	217	W	20	W	19	..	..	..	
	„ „ „	Min. data of 5,			3 42	·53	00		4 61		1 20	4 48	199	V	1	..	0	..	..	..	
159	9 9-'76	3 40	3 06	1	.	7 68	− 04		4 85		1 35	3 90	215		0	S	14	High F_1 & F_2	..	..	High wind
	27 2 '77	..	..	.	*3·05*	·46	00		4 57		1·23	3 90	?	S b W	7	W b S	25	..	..	..	High wind
162	24 10 '76	3 52	3 17	1	..	6 26	− 02		5 27		1 10	3 13	160	ENE	7	NE	4	High F_1, (& F_2 ?)			
	2-2-'78	..	..	..	3 15	49	− 01		4 94		1 26	2 90	217	S	9	S	9	..	..	..	
165	10-10-'77	2 81	2 58	3	..	5·01	− 05		4 42		1 26	2 32	?	E b S	5	SW	7	High F_2 & F_3	..		
	Nos 4 to 6	Max data of 3,			2 46	00	03		4 63		0 97	1 30	170	..	0	E	14	..	..	..	
	„ „ „	Min data of 3,			2 38	4 86	00		4 67		0 73	1 20	150	..	0	..	0	..	..	..	
169	8 2-'77	2 13	1 92	9	..	3 75	00		4 78		1 17	1 75	?	NE	8	S	15	High F_1 & F_2	..		
	Nos. 1, 2, 4 to 10	Max data of 9			1 91	79	03		4 73		1 49	1·00	?200	NE	10	SW	19	..	..	..	Canal not in train in Sets 4 to 19, *see* Table XLVI
	„ „ „	Min data of 9,			1 78	70	00		4 39		0 89	·40	?200	..	0	..	0	..	..	..	
171	31-10-'77	93	·84	2	..	3 67	+ 01		3 66		24	10	038	S	4	S	17	High F_2	..	..	High wind
	20 10- „	..	..	..	84	57	00		3 66		24	·00	?	E	10	S	9	..	..	..	High wind
	„ „	..	..	..	81	·61	+ 08		3·62		24	04	?	S	9	SW	18	..	..	..	High wind
172	26 10-'77	69	62	1	..	3 64	·00		3·39		26	0	?	SE	10	..	0	High F_2	..	..	
	22 10- „	..	.	..	·62	51	− 05		3 42		13	0	?	NW	4	SW b W	10	..	..	..	
177	30 9 '76	1 58	1 42	1	..	2 47	+ 04		5 06		1 14	1 10	?	NE	4	E	17	High F_2	..	..	High wind
	28-9- „	..	..	..	1 42	·33	− 03		5 00		1 00	1 13	18	E	12	E	27	..	..	..	High wind
178	16 10-'77	·86	77	1	..	2 30	·00		4 63		27	·10	?	..	0	SE	5	High F_1	..	..	
	„ „	..	..	..	·76	·55	+ 10		4 08		37	2	?	S b W	7	..	0	..	..	..	Canal not in train.

CUBIC DISCHARGE-VERIFICATION. ABSTRACT TABLE 26.

RANGE OF MEAN VELOCITY MEASUREMENTS OF SAME DAY, AT SAME SITE

[The + and − signs in Range Column indicate that the Mean Velocity increases or decreases with increase of depth]

SITE.	Serial No	Date	Gauge-Reading. H	Mean Velocity V	RANGE of Mean Vely Actual	RANGE of Mean Vely Per cent (of max.)
SOLANI LEFT AQUEDUCT.		24-'75	9 75	3 49	02	6
		" "	·75	3 47		
		31-3- "	9 70	3 64	·10	2 8
		" "	70	3 54		
		1-4- "	9·70	3 49	04	1 1
	102	" "	·70	3 53		
		30-3- "	9 65	3 60	03	8
		" "	65	3 63		
		29-3- "	9 50	3 71	·02	5
		" "	50	3 73		
		3 4- "	9·50	3 47	05	1·4
		" "	50	3 52		
		23-3- "	9 15	3 55	14	3 8
		" "	15	3 69		
		24-3- "	9 15	3 61	·00	·00
		" "	·15	3 61		
		22 3- "	9 10	3 63	·05	1 4
	104	" "	10	3 68		
		25-3- "	9 10	3 67	07	1 9
		" "	·10	3·60		
		20-3- "	8 90	3 65	·02	6
		" "	90	3 61		
		" "	·90	3 59		

SITE	Serial No	Date.	Gauge Reading H	Mean Velocity V	RANGE of Mean Vely Actual	RANGE of Mean Vely Per cent (of max.)
SOLANI RIGHT AQUEDUCT		14 7-'76	8 90	4 02	05	1 2
	111	" "	90	3 97		
		16-4 '77	8 64	3 66	00	·0
		" "	64	3 66		
		17-4- "	8 60	3·69		
		" "	·60	3 72	·07	1 9
		" "	59	3 66		
		" "	·59	3 73		
	112	11 4- "	8 58	3 76		
		" "	·57	3 66	+ 11	2 9
		" "	56	3 75		
		" "	·55	3 65		
		13 7 '76	8 50	3 75	12	3 1
		" "	50	3·82		
		1 4- "	8 05	3 51	00	0
		" "	·05	3 51		
		4 4- "	8·00	3 60		
		" "	00	3 63	·08	2 2
		" "	·00	3 55		
	114	6 4- "	7 98	3 51		
		" "	98	3 50	− 13	3 6
		" "	95	3 63		
		5 4- "	7 95	3 58		
		" "	95	3 58	07	1 9
		" "	95	3 57		
		" "	·95	3 64		

SITE.	Serial No.	Date	Gauge Reading Hor h	Mean Velocity V	RANGE of Mean Vely Actual	RANGE of Mean Vely Per cent (of max.)
R. AQUEDUCT, (L. Aq closed)	131	27-10-'77	4 60	1 21	05	4 0
		" "	60	1 26		
	132	1 9-'76	3 98	4 57	+ 09	1·9
		" "	93	4 78		
	133	20-9-'78	2 71	2 28	+·17	7 5
		" "	60	2 11		
	135	21 9- "	3 18	3 20	+ 41	12 8
	136	" "	·12	2 79		
	134	31 8-'76	3 58	3 22		
	137	" "	·13	2 51	+ 71	22 0
	138	" "	2 88	2 54		
SOLANI EMBANKMENT MAIN SITE.	151	19 12-'78	9 93	3·93	−·11	2 7
		" "	91	4·04		
		22 12-'76	9·98	3 93	05	1 3
		" "	98	3 88		
	152	28-12- "	9 89	3 88		
		" "	91	3 80	−·08	2 1
		26 12- "	9 85	3 74	·12	3 1
		" "	85	3 86		
		29-1-'77	8 44	3 32		
		" "	47	3 26	− 06	1 8
	156	30 1- "	8 41	3 23	−·08	2 5
		" "	42	3 15		
		22 2 '78	7·07	3 19		
	160	" "	07	3 18	+ 04	1 2
		" "	·10	3 22		

SITE	Serial No	Date.	Gauge Reading h	Mean Velocity V	RANGE of Mean Vely Actual	RANGE of Mean Vely Per cent (of max.)
SOLANI EMBANKMENT MAIN SITE.		17-2 '77	3 79	1 87	+ 09	4 8
		" "	78	1 78		
		6 10-'76	3 76	1 91		
		" "	75	1 89	+ 06	3 1
	169	" "	73	1 85		
		" "	72	1·87		
		5-10- "	3·72	1 86		
		" "	71	1 85	+ 01	5
		" "	70	1 85		
	171	30 10 '77	3·61	·81	− 03	3 6
		" "	57	84		
		4-10-'76	2 87	1 82		
		" "	90	1 78		
	175	" "	92	1 80	−·07	3·9
		" "	91	1 75		
		" "	90	1 78		
	178	16-10-'77	2 30	86		
		" "	55	76	− 10	11 6
		2 10-'76	2 00	1 34		
	179	" "	1 99	1·31	+·03	2 2
		3-10- "	1 85	1 21		
		" "	84	1 22	−·01	8
BELLA.	202	23 1-'79	6 98	3 19		
		" "	·94	3 13	+ 06	1 9
	203	25 2- "	6 79	3·06		
		" "	·75	3 01	+ 05	1 6
	204	27 2- "	6·51	2 96		
		" "	·49	2 99	− 03	1 0

SOLANI RIGHT AQUEDUCT

	1-6-'77	10·00	3·96	·09	2 3
	" "	·00	3 87		
	7-6- "	9 97	3 94	02	3
	" "	97	3 96		
108	8-6- "	9·96	3 88	− 03	8
	" "	97	3 85		
	17-5-'76	9 87	3 95	− 05	1 3
	" "	85	4·00		
	8-5-'77	9 65	3 78	04	1 1
	" "	65	3 74		
	14-11- "	9 64	4 28	+ 11	2 5
	" "	66	4 17		
	19-11- "	9 63	4 12	·01	·2
109	" "	63	4 13		
	15-5-'76	9·63	3 86	01	3
	" "	·63	3·87		
	11-5- "	9·63	3 86	−·02	5
	" "	·58	3 88		
	27-4-'77	9 41	3 70	+ 03	·8
	" "	·42	3 73		
	1-5-'76	9·33	3 90	+ 03	8
	" "	30	3 87		
	2-5- "	9·30	3 79	·12	8 1
110	" "	·30	3 91		
	3-5- "	9 30	3 80	02	5
	" "	·30	3 82		
	20-4- "	9 25	3 75		
	" "	·25	3 76	05	1 3
	" "	·25	3 80		
	" "	·25	3 75		
	20-4 '78	9 01	3 85	− 07	1 8
	" "	·02	3 78		
	24-5-'76	8 95	3 81	02	5
111	" "	95	3 80		
	25-4-'77	8 94	3 73	03	8
	" "	·91	3 70		

SOLANI RIGHT AQUEDUCT

114	26-6-'76	7 95	3 76	+ 05	1 3
	" "	89	3 71		
	14-1-'78	6 68	3 53		
	" "	69	3 55	+ 02	·6
	" "	69	3 55		
	16 1- "	6 68	3 60		
	" "	68	3 54	·06	1 7
	" "	68	3 56		
	12 1- "	6 67	3 61	02	6
118	" "	·67	3 63		
	11-12-'77	6 65	3 59		
	" "	·65	3 67	·08	2 2
	" "	65	3 59		
	17-1-'78	6 63	3 57		
	" "	·63	3 58	02	6
	" "	63	3 59		
	13-10 '77	5 93	3 13		
	" "	86	3 12	− 07	2 2
	" "	80	3 18		
	" "	84	3 19		
120	12 10- "	5 77	3 27		
	" "	·76	3 18	+ 09	2 8
	" "	·63	3 27		
	" "	·63	3 24		
	22 12- "	4 57	2 77		
	" "	57	2 81		
	" "	57	2 88	·11	3 8
	" "	57	2 83		
	" "	57	2 84		
122	" "	57	2 84		
	24 12- "	4 43	2 69		
	" "	45	2 72	− 05	1 8
	" "	42	2 74		
	23 8 '78	4 43	3 24		
	" "	38	·35	− 11	3 3
126	11 7- "	1 92	1 24		
127	" "	·70	60	+ 64	51 6

SOLANI EMBANKMENT MAIN SITE.

	19 2-'78	6 84	3 14	04	1 3
	" "	84	3 18		
	23 1- "	6 83	3 11		
161	" "	84	3 10	− 01	·3
	24 1- "	6 84	3 16		
	" "	83	3 14	+ 02	6
	22 1- "	6 82	3 08		
	" "	82	3 08	00	0
	24 10-'76	6 28	3 41		
162	" "	·26	3 52	−·11	3 1
	21-10- "	5 66	3 15		
	" "	62	3 12	+ 03	1 0
	19 10 "	5 53	3 06		
163	" "	56	2 99	− 07	2 3
	20-10- "	5 55	3 04		
	" "	·51	2 95	+·09	3 0
164	11-10 '77	5 24	2 73	+ 40	14 7
166	" "	4 26	2 33		
	10 10 '76	4 97	2 62		
	" "	5 00	2 60	− 16	6 1
165	" "	·00	2 46		
	11-10- "	4 90	2 42		
	" "	86	2 38	+ 04	1 7
165	10 10-'77	5·01	2 87	+·48	16 7
166	" "	4 53	2 39		
	7 10-'76	4 08	2 06	00	·0
	" "	·07	2 06		
	10 2 '77	4 00	2 17	01	5
	" "	·00	2 16		
167	14-2- "	3 98	2 20	01	5
	" "	98	2 19		
	19 2- "	3 99	2 15		
	" "	90	2 14	+ 05	2 3
	" "	92	2 10		
168	15 10 "	3 98	1 69	+·23	13 6
170	" "	3 64	1 46		

JAOLI

211	7-1-'79	7 28	2·93	04	1 4
	" "	28	2 97		
212	25-2- "	6 60	2 82	− 05	1 7
213	" "	57	2 87		
214	27 2- "	6 23	2·81	02	7
	" "	23	2 79		
215	15-1- "	5 96	2 95	+·11	3 7
216	" "	·74	2 84		

KAMHERA

	4-1-'79	6·03	2 82	− 01	4
	" "	·02	2 83		
222	15-1- "	6 00	2 77	+ 02	7
	" "	01	2 79		
	17-1- "	6 01	2 85	00	·0
	" "	·00	2 85		
	14-1- "	5 93	2 95	+ 09	3 1
	" "	·92	2 86		
223	27 2- "	5 73	2 79	+ 01	·4
	" "	·72	2 78		
224	25 2- "	5 45	2 70	·01	4
	" "	·45	2 69		

DISTRIBUTARIES.

231	29 3 '79	4 35	2 51	− 01	·4
	" "	34	2 52		
232	28 3- "	3 10	2 10	·00	0
	" "	·09	2 10		
	13 3- "	4 08	2 14	00	0
233	" "	·05	2 14		
	18-3- "	3 90	2 10	+ 07	3 3
	" "	85	2·03		
	21 3- "	2 83	1 49	·00	0
236	" "	·83	1 49		
237	19-3- "	3·79	1·81	−·02	1 1
	" "	·78	1·84		
238	20-3 "	3 37	1 79	+·08	4 5
	" "	28	1·71		

CUBIC DISCHARGE-VERIFICATION — ABSTRACT TABLE 27.

Discharge Measurements at same Site on same day.

Details of Cases of very high (over 10 %), high (over 5 %), and moderate (over 3 %), Discrepancy

[The + and − signs in the Discrepancy Column indicate that the Mean Velocity increases or decreases with the depth]

Discrepancy	Sites	Serial No	1 Date, 1875 79	8 Mean Velocity: High V.	Low V.	Discrepancy: Actual.	Per cent (of mean)	2 Depth: Gauge Mark	Variation.	3 Reach Fall: Middle F_1	Lower F_2	Slope S	4 Wind: From Direction	From Velocity	To Direction	To Velocity	5 Timekeeper	Probable Causes: of high velocity	of uncertain results.
High and very high (over 5, & 10 %)	Solani Right Aqueduct Left Aqueduct closed / Left open	126	11-7-'78	1 24	..			1 99	− 24										
		127	" "	..	60	+ 64	51 6	0 70	00										Water fell 1 36
		136	21 9 '78	..	2 79			3 12	+ 03										
		135	" "	3 20	..	+ 41	12 8	3 18	+ 05										
		138	31 8-'76	..	2 54	+ 68	21 1	2 88	+ 05										
		137	" "	..	2 51	+ 71	22 0	3 13	+ 10										
		134	" "	3 22	..	..	..	3 58	+ 06										
		139	20 9-'76	2 28	..	+ 17	7 5	2 71	− 02										
			" "	..	2 11			2 60	-00										
		136	21 9 '76	..	2 79			3 12	+ 03										
		135	" "	3 20	..	+ 41	12 8	3 18	+ 05										
		138	31 8-'76	..	2 54	+ 68	21 1	2 88	+ 05										
		137	" "	..	2 51	+ 71	22 0	3 13	+ 10										
		134	" "	3 22	..	..	..	3 58	+ 06										
		139	20 9-'76	2 28	..	+ 17	7 5	2 71	− 02										
			" "	..	2 11			2 60	-00										
		166	11 10-'77	..	2 33	+ 40	14 7	4 26	00										
		164	" "	2 73	..	..	..	5 24	+ 75										
		165	10-10-'76	2 62	..	− 16	6 1	4 97	+ 02										
			" "	2 60	..	-14	5 4	5 00	+ 03										
			" "	..	2 46	..	.	5-00	00										
		165	10 10-'77	2 87	..	..	..	5 01	− 05										
		166	" "	..	2 39	+ 48	16 7	4 53	− 07										
		168	15 10-'77	1 69	..	..	..	3 98	− 23										
		170	" "	..	1 46	+ 23	13 6	3 64	− 06										
		178	16 10-'77	86	..			2 30	00										
			" "	..	-76	− 10	11 6	2 50	+ 10										
										1 23	2 00	?	E	4	E	10	G		
										1 72	2 49	?	W	7	N	4	P	High F_1, F_2, and F_3	Water rose 1 35
										94	1 30	180	..	0	NW	6	W	High F_1	
										97	"	170	NW	6	..	0	P	High F_1	Water rose ·05.
										"	"	170	..	0	W	5	W	.. ..	
										1 26	2 32	?	E b S	5	SW	7	G	High F_2	
										1 20	1 90	?	WSW	9	WSW	6	G	.. ..	Water fell ·54
										65	60	?	ENE	9	E	17	G	High F_1, F_2, and F_3	
										56	30	?	SE b S	5	V	/	G	.. ..	Water fell ·48.
										27	·10	?	..	0	SE	8	G	High F_1	
										37	·25	?	S b W	7	..	0	P	.. ..	Water rose 30
										No Middle Sub Reach									

Cases of moderate (over 3 per cent) Discrepancy

SOLANI AQUEDUCTS.	Left	104	23-3-'75	..	3 55	·14	3 8	9 15	00	8½	5 60	No Middle Sub Reach.	6 15	?	..	0	?	70	R	..	..		..	..		
			" "	3 69	..			9 15	·00	8½	,		"	?	?	70	..	0	W	..	..	?	..	..		
	Right (Left open)	110	2 5-'76	..	3 79	·12	3 1	9 30	·00	9	5 85		5 25	190	..	0	..	0	W	..	..		..	..		
			" "	3 91	..			9 30	00	9	"		"		..	0	..	0	H	..	..	?	..	..		
		112	13-7 "	..	3 75	12	3 1	8 50	00	8	5 90		4 00	220	..	0	NNE	8	H	..	..		..	..		
			" "	3 82	..			8 50	00	8	"		"	"	NNE	8	NE	6	W	..	..	?	..	..		
			6-4- "	3 63	..	..	..	7 95	00	7	5 85		4 25	?	..	0	..	0	H	..	..	?	..	..	Water unsteady.	
		114	" "	..	3 51	− 12	3 3	7 98	+·05	7	5 82		4 28	?	..	0	SW	5	W	..	..		..	..		
			" "	..	3 50	− 13	3 6	7 98	− 05	7	"		"	?	SW	5	SW	9	H	..	..		..	..		
		122	22-12-'77	..	2 77	·11	3 8	4 57	00	4	5 63		1 77	?	E	8	V	5	P	..	..		..	..		
			" "	2 88	..			4 57	00	4	"		"	?	S	9	S	9	P	..	..	?	..	..		
		122	23-8-'78	3 35	..	− 11	3 3	4 35	+ 05	3½	6·05		1 90	260	..	0	N	5	R	Short Rod, High S					Water rose ·13.	
			" "	..	3 24			4 43	+ 05	4	6 37		2 23	243	N	7	E	8	P	..	..		..	..		
	Right Lelopeli	131	27 10-'77	..	1 21	·05	4 0	4 60	00	4	3 60		·10	024	..	0	SW	6	G	..	..		..	..		
			" "	1·26	..			4 60	00	4	"		"	026	SW	6	NE	5	P	..	..	?	..	..		
SOLANI EMBANKMENT MAIN SITE.		152	26 12-'76	..	3 74	·12	3 1	9 85	+ 01	Longest possible.	4 78	1·18	5 96	?	SE	4	E	13	P	..	..		..	..	High wind.	
			" "	3 86	..			9 85	·00		"	1 17	5 95	?	E	9	SE	5	W	..	..	?	..	..	.. ..	
		162	24 10- "	..	3 41	−·11	3·1	6 28	− 01		5 25	1 10	3 15	170	..	0	ENE	7	P	..	..		..	..		
			" "	3 52	..			6 26	− 02		5 27	"	3 13	160	ENE	7	NE	4	W	..	..	?	..	..		
		169	17-2-'77	1 87	..	+·09	4 8	3 79	− 03		4 39	96	90	?	SW	6	S	6	P	..	..	?	..	..	.. ..	
			" "	..	1 78			3 78	00		4 40	·95	89	?	S	6	SW	19	W	..	..		..	..	High wind.	
		169	6 10-'76	1 91	..	+ 06	3 1	3 76	00		4 67	93	1·00	200	..	0	..	0	P	..	..	?	..	..		
			" "	..	1 85			3 73	− 01		4 70	90	"	"	NNE	7	NE	5	P	..	..		..	..		
		171	30-10-'77	84	..	−·03	3 6	3·57	00		3 66	24	00	?	E	10	S	9	G	..	..	?	..	..	High wind.	
			" "	..	81			3·61	+ 08		3 62	·24	04	?	S	9	SW	18	P	..	..		..	..	Water rose ·08.	
		175	4 10-'76	1 82	..	− 07	3 9	2 87	+·05		5 06	1 14	1 40	215	..	0	..	0	H	..	..	?	..	..	Water rose ·06.	
			" "	..	1 75			2 91	− 01		5·02	1 18	"	"	..	0	..	0	W	..	..		..	..		
JAIL		215	15-1-'79	..	2 84	+·11	3 7	5 74	+ 06	"	·40	..	4 39	166	N	8	..	0	S	..	..		..	..	Water rose ·29.	
		216	" "	2 95	..			5 96	+·08	"	18	..	4 61	"	S	7	V	1	R	..	..	?	..	..		
KAM HERA		223	14-1-'79	2 95	..	+·09	3 1	5 93	− 01	"	3 00	..	11 49	295	N	13	N	13	Cl	..	..	?	..	..	High wind.	
			" "	..	2 86			5 92	·00	"	2 99	..	11·48	"	NW	10	NW	6	C	..	..		..	..	.. ..	
DISTRIBUTARIES.		233	18 3-'79	..	3 03	+ 07	3 3	3 83	00		?	?	?	?	..	0	..	0	B	..	..		..	..	Water rose ·08	
			" "	2 10	..			3 90	+·06		?	?	?	?	..	0	..	0	C	..	..	?	..	..		
		238	20-3- "	1 79	..	+ 08	4 5	3 37	− 02		?	?	?	?	..	0	W	1	B	..	..	?	..	..	Water fell ·13.	
			" "	..	1·71			3·28	− 00			?	?	?	W	1	W	1	C	..	..		..	..		

SIMULTANEOUS DISCHARGE-MEASUREMENTS AT SUCCESSIVE SITES OF SAME REACH.

	1			2			3				4				5	7		9			
	SITE (see last column)	Serial No.	Date, 1878-79	DEPTH.			SURFACE FALL				WIND					CUBIC DISCHARGE		DISCREPANCY			
									Local Slope		From		To					Gain + Loss −		Probable cause of Discrepancy.	Reference to Sites.
				Above Datum (at Site)	Variation	At Solani Aqueduct Gauge.	Upper 5 miles	Lower 4½ miles.	Left Bank	Right Bank.	Direction.	Velocity.	Direction.	Velocity	Timekeeper's Initial	Partial (at lower Site)	Total	Actual.	Per cent (of larger)		
				h			F_1+F_2	F_2	S	S						D	D				
17	Embkt	151	14-12-78	10·04	− ·05	10·03	5·92	5·60	230	?	E	7	..	0	A	..	7,364				
	L. Aq	101	„ „	10·00	−·03	10·00	5·95	5·57	183	..	NE	4	S	9	Cl	3,429		−284	3·9	?	?
	R. Aq	108	„ „	9·98	·00	9·98	5·97	5·55	..	175	S	9	?	3	Cl	3,651	7,080				
18	Embkt	151	19-12-„	9·91	+ ·04	9·80	6·00	5·40	228	22·	E	4	E & S	8	A	..	7,197				
	L. Aq	101	„ „	9·87	− ·03	·87	5·93	5·47	190	..	SE	1	NE	5	C	3,409				High ($F_1 + F_2$).	
	R. Aq	108	„ „	9·87	·00	·87	„	„	..	200	NE	5	NE	1	C	3,444	6,853	−344	4·8	High F_2.	
																				„ „	
19	Embkt.	151	20-12-„	9·88	−·01	9·80	5·90	5·40	228	238	S	3	W	10	A	..	6,940				
	L. Aq	101	„ „	9·83	− ·01	·83	5·87	5·43	195	..	..	0	W	3	Cl	3,441					
	R. Aq	108	„ „	9·82	+ ·02	·82	5·88	5·42	..	205	W	4	SW	12	Cl	3,519	6,960	+ 20	·3	?	?
20	Embkt.	153	15-4-'79	9·43	+·15	9·38	5·82	5·23	265	218	W	9	W	25	P	..	6,185				
	L. Aq	103	„ „	9·37	+ ·03	·37	5·83	5·22	215	..	NW	1	SW	12	B	3,034				Water rose ·15,	
	R. Aq	110	„ „	9·42	+·05	·42	5·78	5·27	..	200	V	1	SW	12	B	3,047	6,081	−104	1·7	and high wind.	
21	Embkt	153	12-4-'79	9·47	·00	9·43	5·97	4·75	205	228	E	8	E	8	G	..	6,162			..	..
	L. Aq	103	„ „	9·41	+·12	·41	5·99	4·71	198	..	SE & S	7	NE	5	R	3,107				Water rose ·12.	
	R. Aq	109	„ „	9·51	·00	·51	5·89	4·81	..	190	V	12	E	23	R	3,190	6,297	+135	2·1	High wind.	
22	Embkt	153	28-5-„	9·50	− ·01	9·44	5·96	5·14	243	235	W	7	W	9	G	.	6,187				
	L. Aq	103	„ „	9·48	·00	·48	5·92	5·18	205	..	W	6	NW	7	R	3,107					
	R. Aq	110	„ „	9·42	·00	·42	5·98	5·12	..	186	NW	1	V	1	R	3,223	6,330	+143	2·3	?	?
23	Embkt.	153	27-5-„	9·45	−·01	9·38	5·92	5·08	220	233	V	1	V	9	P	..	6,231				
	L. Aq	103	„ „	9·40	·00	·40	5·90	5·10	210	..	SW & W	8	SW	8	T	3,126					
	R. Aq	110	„ „	9·38	·00	·38	5·92	5·08	..	190	S	8	SW	13	T	3,122	6,248	+ 17	·3	?	?
24	Embkt.	153	6-4-„	8·75	·00	8·67	5·93	4·74	215	233	W	6	W	6	G	..	5,379				
	L. Aq	105	„ „	8·67	·00	·67	5·93	4·74	220	..	NW	2	W	5	T	2,781					
	R. Aq	112	„ „	8·67	·00	·67	„	„	..	193	W	3	NW	3	T	2,892	5,673	+294	5·2	?	?

Upper Site, Solani Embankment Main Site;
Lower Site, Solani Twin Aqueducts

Cases of moderate (over 3 per cent) Discrepancy

SOLANI AQUEDUCTS. Left.	104	23 3 '75	..	3 55	·14	3 8	9 15	00	8½	5 65	No Middle SubReach.	5 15	?	..	0	?	70	R	..	..	?	..	..	
		„ „	3 69	..			9 15	00	8½	,		„	?	?	70	..	0	W	..	..		..	..	
Right (Left open)	110	2 5-'76	..	3 79	12	3 1	9 30	00	9	5 85		5 25	190	..	0	..	0	W	..	..		..	..	
		„ „	3 91	,			9 30	00	9	„		„		..	0	..	0	H	..	..	?	..	..	
	112	13 7- „	..	3 75	12	3 1	8 50	00	8	5 90		4 00	220	..	0	NNE	8	H	..	..		..	..	
		„ „	3 82	..			8 50	00	8	„		„	„	NNE	8	NE	5	W	..	..	?	..	..	
	114	6-4- „	3 63	..	..	..	7 93	00	7	5 85		4 25	?	..	0	..	0	H	..	..	?	..	..	} Water unsteady
		„ „	..	3 51	− 12	3 3	7 98	+ ·05	7	5 82		4 28	?	..	0	SW	5	W	..	..		..	..	
		„ „	..	3 50	− 13	3 6	7 98	− 05	7	„		„	?	SW	5	SW	9	H	..	..		..	..	
	122	22-12 '77	..	3 77			4 57	00	4	5 63		1 77	?	E	8	V	5	P	..	..		..	..	
		„ „	3 88	..	·11	3 8	4 57	00	4	„		„	?	S	9	S	9	P	..	..	?	..	..	
	122	23 8-'78	3 35	..	− 11	3 3	4 35	+ 05	3½	6 05		1 95	260	..	0	N	5	R	Short Rod, High S					} Water rose ·13.
		„ „	..	3 44			4·43	+ 05	4	6 37		2 23	243	N	7	E	8	P	..	..		..	..	
Right (L. closed)	131	27-10-'77	..	1 21	·05	4 0	4 60	00	4	3 60		·10	024	..	0	SW	6	G	..	..		..	..	
		„ „	1 26	..			4 60	00	4	„		„	026	SW	6	NE	5	P	..	..	?	..	..	
SOLANI EMBANKMENT MAIN SITE.	152	26-12-'76	..	3 74	·12	3 1	9 85	+ ·01	Longest possible.	4 78	1·18	5·96	?	SE	4	E	13	P	..	..		..	..	High wind.
		„ „	3 86	..			9 85	00		„	1 17	5 95	?	E	9	SE	5	W	..	..	?	..	..	.. ..
	162	24-10- „	..	3 41	−·11	3 1	6 28	−·01		5 25	1 10	3 15	170	..	0	ENE	7	P	..	..		..	..	
		„ „	3 52	..			6 26	− 02		5 27	„	3 13	160	ENE	7	NE	4	W	..	..	?	..	..	
	169	17 2-'77	1 87	..	+·09	4 8	3 79	− 03		4 39	96	90	?	SW	6	S	6	P	..	..	?	..	..	.. ..
		„ „	..	1 78			3 78	00		4 40	·95	89	?	S	6	SW	19	W	..	..		..	..	High wind.
	169	6-10-'76	1 91	..	+ 06	3 1	3 76	00		4 67	93	1 00	200	..	0	..	0	P	..	..	?	..	..	
		„ „	..	1 85			3 73	− 01		4 70	90	„	„	NNE	7	NE	5	P	..	..		..	..	
	171	30-10-'77	84	..	−·03	3 6	3·57	00		3 66	·24	·00	?	E	10	S	9	G	..	..	?	..	..	} High wind.
		„ „	..	81			3 61	+ 08		3 62	24	04	?	S	9	SW	18	P	..	..		..	..	} Water rose ·08.
	175	4-10-'76	1 82	..	− 07	3 9	2 87	+ ·05		5 06	1 14	1 40	215	..	0	..	0	H	..	..	?	..	..	} Water rose ·06.
		„ „	..	1 75			2 91	− 01		5 02	1 18	„	„	..	0	..	0	W	..	..		..	..	
JAOLI.	215	15-1-'79	..	2 84	+·11	3 7	5 74	+ 06	„	40	..	4 39	166	N	3	..	0	S	..	..		..	..	} Water rose ·29.
	216	„ „	2 95	..			5 96	+ 03	„	18	..	4 61	„	S	7	V	1	R	..	..	?	..	..	
KAN HERA	223	14-1-'79	2 95	..	+·09	3 1	5 93	− 01	„	3 00	..	11 49	290	N	13	N	13	Cl	..	..	?	..	..	High wind.
		„ „	..	2·86			5·92	− ·00	„	2·99	..	11·48	„	NW	10	NW	6	C	..	..		..	..	.. ..
	233	18-3-'79	..	2·03	+ ·07	3 3	3 83	·00	? possible	?	?	?	?	..	0	..	0	R	..	..		..	..	} Water rose ·08.
		„ „	2 10	..			3 90	+ ·06		?	?	?	?	..	0	..	0	C	..	..	?	..	..	
	238	20-3- „	1·79	..			3·37	− ·02		?	?	?	?	..	0	W	1	R	..	..	?	..	..	} Water fell ·12

DISCHARGE-MEASUREMENTS AT SUCCESSIVE SITES OF SAME REACH, NON-SIMULTANEOUS.

SOLÁNÍ EMBANKMENT MAIN SITE, AND SOLÁNÍ TWIN AQUEDUCT SITES.

COMPARISON NO.	1			2			3		4				5	7			8	9		Probable cause of Discrepancy.
	SITE.	Serial No.	Date, 1877.	DEPTH			SURFACE FALL		WIND.					CUBIC DISCHARGE.				DISCREPANCY in Discharge.		
									From		To							Gain + Loss −		
				Above Datum (at Site)	Variation	At Solání Aqueduct Gauge	Upper 5 miles	Lower 4½ miles	Direction	Velocity.	Direction.	Velocity	Timekeeper's Initial.	At Lower Sites	Correction for change of depth	Total	Mean Velocity	Actual.	Per cent. of max.	
				h or H			$F_1 + F_2$	F_2						D		D	V			
1	Embkt.	157	3 3	8 13	·00	8·05	5 90	4·35	S	4	..	0	W	..	..	4,750	3 26			High F_2.
	L. Aq	106	23-2	7 97	·00	7 97	5 98	4 17	S	13	S	17	W	2,399	+ 24	4,934	3 54	+ 184	3 7	High $(F_1 + F_2)$.
	R. Aq	114	,,	7 97	·00	·97	,,	,,	S	8	S	13	W	2,486	+ 25		3 67			High wind.
2	Embkt	157	5-3	8 10	00	8 00	5 90	4 30	N	4	N	4	P	..	..	4,893	3 37			
	L Aq	106	,,	8 00	·00	00	,,	,,	S	6	V	1	P	2,368	0	4,782	3 48	− 111	2 3	? ?
	R. Aq	114	,,	8 00	·00	00	,,	,,	V	1	S	6	P	2,414	0		3 55			
3	Embkt.	157	6-3	8 08	+ ·01	7 97	5 93	4 27	NW	10	..	0	W	..	..	4,594	3 18			
	L Aq	106	,,	7 98	00	98	5 92	4 28	..	0	..	0	W	2,328	− 3	4,806	3 43	+ 212	4 4	? ?
	R Aq	114	,,	7 98	·00	·98	,,	,,	N δ E	7	..	0	W	2,484	− 3		3 66			
4	Embkt.	157	7-3	8·07	·00	7 97	5 93	4 27	NW	4	SW	4	P	..	..	4,835	3 35			.. ..
	L Aq	106	23 3	7 97	·00	97	5 83	4 27	V	1	V	1	P	2,227	0	4,709	3 34	− 126	2 6	Low F_1.
	R. Aq	114	7-3	7 98	·00	·98	5 92	4 28	V	1	S	17	P	2,485	− 3		3 66			High wind.
5	Embkt.	159	2-3	7 60	·00	7 55	5 85	4 00	W	9	W	14	W	..	..	4,467	3 26			High wind.
	L. Aq	107	15-3	7·43	00	43	5 87	3 93	S	4	N	7	W	2,151	+ 35	4,309	3 41	− 158	3 5	Low F_2
	R. Aq	116	27-3	7·56	+ 02	·56	5 84	4 01	N	5	NW	4	W	2,126	− 3		3 49			.. ..
6	Embkt.	159	27-2	7 46	·00	7 40	5 80	3 90	S δ W	7	W δ S	25	P	..	..	4,108	3·05			High wind.
	L. Aq	107	21-2	7 48	·00	48	6 02	3 98	V	g	V	g	P	2,131	− 23	4,418	3 35	+ 310	7·0	High $(F_1 + F_2)$.
	R. Aq	116	,,	7 45	+ 06	·45	6 05	3 95	V	g	V	g	P	2,325	− 15		3 57			

CUBIC DISCHARGE-VERIFICATION. ABSTRACT TABLE 29.

Simultaneous Discharge-Measurements at successive Sites of same Reach.

Fifteenth Mile Site, and Solání Embankment Main Site

Comparison No.	1			2				3				4				5	7	9		
	Site.	Serial No.	Date, 18-8-79	Depth: Above Datum [1st Site.] A	Depth: Variation	Depth: At Solání Aqueduct Gauge	Date of Soundings	Surface Fall: Upper 5 miles. F_1+F	Surface Fall: Lower 4½ miles. F_2	Local Slope: Left Bank. S	Local Slope: Right Bank. S	Wind. From: Direction.	Wind. From: Velocity	Wind. To: Direction	Wind. To: Velocity	Timekeeper's Initial.	Cubic Discharge. D	Discrepancy: Gain + Loss − Actual.	Discrepancy: Gain + Loss − Per cent. [of larger]	Probable cause of Discrepancy.
7	15th M	196	18 12 '78	15 20	− 03	9 83	16-12-'78	5 97	5·43	215	?	W	3	..	0	R	6,921	+423	5 8	? ?
	Embkt.	151	„ „	9 95	− 01	88	„ „	5 92	5 48	225	228	S	6	E	7	P	7,344			
8	15th M	196	19 12- „	15 17	+ 01	9 83	16-12- „	5·85	5·45	213	238	..	0	V	1	S	6,844	+353	4 9	.. ..
	Embkt.	151	„ „	9 91	+ 04	80	„ „	6 00	5 40	228	225	E	4	E by S	8	A	7,197			High (F_1 + F_2).
9	15th M	196	20-12 „	15 10	00	9 80	16 12 „	5 90	5 23	210	233	..	0	V	1	R	6,806	+134	1 9	.. ..
	Embkt	151	„ „	9 88	− 01	80	„ „	5 90	5 40	228	238	S	3	W	10	A	6,940			High F_2.
10	15th M	197	15-4-'79	14 69	+·10	9 33	28 4 '79	5 85	5 20	215	225	V	1	SW	14	S	6 287	−102	1 6	High wind.
	Embkt	153	„ „	9·43	+·15	·38	16 12 '78	5 82	5 23	265	218	W	9	W	25	P	6,185			
11	15th M	191	29 5-'78	15 31	+ 02	9 99	28 3-'78	5 91	5 54	240		NW	1	NE	3	R	7,187	−597	8 3	? ?
	Embkt	152	„ „	10·03	−·07	98	15-8 '76	5 92	5 53	213		W	8	..	0	G	6,590			
12	15th M	192	10-4 „	14 33	− 01	9 00	28-3-'78	5 90	4 90	253		..	0	..	0	T	6,226	−357	5 7	? ?
	Embkt.	154	„ „	9 11	+ 02	00	15-8-'76	5 90	4 90	215		V	1	..	0	G	5,869			
13	15th M	193	8-4 „	14 03	+ 12	8 70	28 3 '78	5 90	4 75	228		..	0	..	0	R	5,851	−391	6 7	? ?
	Embkt	155	„ „	8 82	+ 05	70	15 8 '76	5 90	4 75	215		V	1	W	6	P	5,460			
14	15th M	193	4-4- „	13 98	00	8 70	28 3 '78	5 90	4 75	223		..	0	..	0	T	5,771	−154	2 7	? ?
	Embkt.	155	„ „	8 80	+ 01	70	15-8 '76	5 90	4 75	217		W	6	..	0	P	5,617			
15	15th M	193	29 3- „	13 95	00	8 70	28 3 '78	5 90	4 70	230		N	8	NW	7	R	5,737	−372	6 5	.. ..
	Embkt.	155	„ „	8 73	− 02	·70	15 8-'76	5 90	4 70	205		W	20	W	19	P	5,365			High wind.
16	15th M.	195	25 5- „	12 53	+·15	7·03	28-3- 78	5 85	3 65	?		..	0	N	1	T	4,370	−208	4 8	? ?
	Embkt.	160	„ „	7 20	+ 09	·03	15 8 '76	5 85	3 63	218		..	0	V	1	G	4,162			

Not observed.

SIMULTANEOUS DISCHARGE-MEASUREMENTS AT SUCCESSIVE SITES OF SAME REACH

COMPARISON No	1 SITE (see last column)	1 Serial No.	1 Date, 1878 79	2 DEPTH. Above Datum (at Site) h	2 DEPTH. Variation.	2 DEPTH. At Soldal Aqueduct Gauge.	3 SURFACE-FALL. Upper 5 miles. F_1+F_2	3 SURFACE-FALL. Lower 4½ miles. F_2	3 SURFACE-FALL. Local Slope. Left Bank S	3 SURFACE-FALL. Local Slope. Right Bank. S	4 WIND. From Direction.	4 WIND. From Velocity	4 WIND. To Direction.	4 WIND. To Velocity	5 Timekeeper's Initial.	7 CUBIC DISCHARGE. Partial (at lower Site) D	7 CUBIC DISCHARGE. Total. D	9 DISCREPANCY. Gain + Loss − Actual.	9 DISCREPANCY. Gain + Loss − Per cent (of larger).	Probable cause of Discrepancy.	Reference to Sites
17	Embkt	151	14-12-'78	10 04	− 05	10·03	5 92	5 60	230	?	E	7	..	0	A	..	7,364				Upper Site, Soldal Embankment Main Site; Lower Site, Soldal Twin Aqueducts
	L Aq	101	„ „	10 00	−·03	10 00	5 95	5 57	183	..	NE	4	S	9	Cl	3,429					
	R. Aq	108	„ „	9 98	00	9 98	5 97	5·55	..	177	S	9	?	?	Cl	3,651	7,080	−284	3 9	? ?	
18	Embkt.	151	19-12- „	9 91	+ 04	9 80	6 00	5 40	228	225	E	4	E & S	8	A	..	7,197				
	L. Aq	101	„ „	9 87	− 03	·87	5 93	5 47	190	..	SE	1	NE	5	C	3,409				High (F_1+F_2)	
	R. Aq	108	„ „	9·87	·00	87	„	„	..	200	NE	5	NE	1	C	3,444	6,853	−344	4 8	High F_2	
																				„ „	
19	Fmbkt.	151	20 12- „	9 88	− 01	9 80	5 90	5 40	228	238	S	3	W	10	A	..	6,940				
	L. Aq	101	„ „	9 83	− 01	·83	5 87	5 43	195	..	..	0	W	3	Cl	3,441					
	R Aq	108	„ „	9 82	+ 02	·82	5 88	5 42	..	205	W	4	SW	12	cl	3,519	6,960	+ 20	·3	? ?	
20	Embkt	153	15 4-'79	9 43	+·15	9 38	5 82	5 23	265	218	W	9	W	25	P	..	6,185				
	L. Aq	103	„ „	9 37	+ 03	37	5·83	5 22	215	..	NW	1	SW	12	B	3,034				Water rose 15,	
	R Aq	110	„ „	9 42	+·05	42	5 78	5 27	..	200	V	1	SW	12	B	3,047	6,081	−104	1·7	and high wind	
21	Fmbkt.	153	12-4-'78	9 47	00	9·43	5 97	4·70	205	228	E	8	E	8	G	..	6,162			.. ..	
	L. Aq	103	„ „	9 41	+ 12	41	5 99	4 71	198	..	SE & S	7	NE	8	B	3,107				Water rose ·12.	
	R. Aq	109	„ „	9 51	00	51	5 89	4 81	..	190	V	12	E	23	B	3,190	6,297	+135	2 1	High wind.	
22	Embkt	153	28 5- „	9 50	− 01	9 44	5·96	5 14	243	235	W	7	W	9	G	..	6,187				
	L Aq	103	„ „	9 48	00	·48	5 92	5 18	205	..	W	6	NW	7	B	3,107				? ?	
	R. Aq	110	„ „	9 42	·00	42	5 98	5 12	..	188	NW	1	V	1	B	3,223	6,330	+143	2 3		
23	Embkt.	153	27 5- „	9 45	− 01	9 38	5 92	5 08	220	233	V	1	V	9	P	..	6,231				
	L Aq	103	„ „	9 40	00	40	5 90	5 10	210	..	SW & W	8	SW	8	T	3,126				? ?	
	R. Aq	110	„ „	9 38	00	38	5 92	5 08	..	190	S	8	SW	13	T	3,122	6,248	+ 17	·3		
24	Embkt.	155	6 4- ,	8 75	·00	8 67	5 93	4 74	215	233	W	6	W	6	G	..	5,379				
	L Aq	105	„ „	8 67	·00	·67	5 93	4 74	225	..	NW	2	W	5	T	2,781				? ?	
	R Aq	112	„ „	8 67	00	67	„	„	..	193	W	3	NW	3	T	2,892	5,673	+294	5 2		

25	Embkt.	15.5	20-3	'78	8 53	− 21	8 48	5 92	4 48	199	230	SW	l	WSW	l	G	.	5,212	+ 94	1·8	Water fell 25	Upper Site Solani Embankment Main Site Lower Site Solani Twin Aqueducts
	L. Aq	10.5	„	„	8 54	− 12	54	5 86	4·54	218		SW	l		0	R	2 629					
	R. Aq	112	„	„	8 41	− 12	41	5 99	4 41		198	WSW	5	WSW	l	R	2,677	5,306				
26	Embkt.	157	21 3	„	8 24	00	8 18	5·82	4 38	201	23?	SE	3	V	l	G	.	5,070	+ 64	1 3	? ?	
	L. Aq	106	„	„	8 19	00	19	5 81	4 33	2.0		SE	3	..	0	T	2 465					
	R. Aq	113	„	„	8 16	00	16	5 84	4 36		228	..	0	V	l	T	2,669	5,134				
27	Embkt.	157	12 3	„	8·0.5	00	7 99	5 86	4 19	200	227	SE	6	SE	8	P		4 826	+ 16	3	? ?	
	L. Aq	106	„	„	8 00	00	8 00	5 8.5	4 20	210		SE	6	SE	2	T	2 377					
	R. Aq	114	„	„	7 98	00	7 98	5 87	4·18		19.5	.	0	SE	8	T	2,46.5	4,842				
28	Embkt.	159	9-3	„	7 63	− 02	7 5.5	5 90	3 9.5	214	25.5	.	0	.	0	P		4,418	+ 161	3 5	? ?	
	L. Aq	107	„	„	7 56	+ 02	·56	5 89	3 96	220		..	0	N	3	T	2 230					
	R. Aq	116	„	„	7 5.5	00	5.5	5 90	3 9.5		203	V	l	..	0	T	2,319	4 579				
29	Embkt	159	8 3	„	7 61	− 01	7 53	5 92	3 93	211	241	W	10	V	l	P	..	4,436	+ 88	2 0	? ?	
	L. Aq	107	,	,	7 53	− 03	53	5 92	3 93	223		SW	9	NW	4	R	2,228					
	R. Aq	116	„	„	7 .50	00	50	5 9.5	3 90		20.5	NW	6	NW	l	R	2,296	4,524				
30	Embkt.	159	11 3	„	7 60	− 01	7 51	5 94	3 91	218	233	..	0	.	0	G		4,452	+ 64	1 4	? ?	
	L. Aq	107	„	„	7 51	00	51	5 94	3 91	23.5		.	0	..	0	R	2 211					
	R. Aq	116	„	„	7·.50	·00	50	5 J.5	3 90	..	20.5	..	0	..	0	R	2,30.5	4 516				
31	Embkt.	159	7 3		7 61	00	7 50	5 90	3 90	213	238	S b W	6	W	7	G		4,373	+ 66	1 5	? ?	
	L. Aq	107	„	,	7 50	·00	50	5 90	3 90	223	.	S	6	..	0	T	2 183					
	R. Aq	116	„	,	7 .50	00	50	„	„		213	V	l	S	7	T	2 256	4,439				

Simultaneous Discharge-Measurements at three Sites

18 & 8	15th M	19.5	19 12	'78	15 17	+ 01	9 8.5	5 85	5 4.5	213	238	.	0	V	l	S	..	6 844	+353	4 9	Water unsteady [see Aqueduct Gauge]	Upper, 15th Mile New Site Middle Solani Embankment Main Site Lower, Solani Twin Aqueducts
	I mbkt	151	„	,	9 91	+ 04	86	6 00	5 40	228	22.5	E	4	E b S	5	A	.	7,197				
	L. Aq	101	„	„	9 87	− 03	87	5 93	5 47	19.5	..	SE	l	NE	5	C	3 409					
	R. Aq	108	„	„	9 87	00	87	„	„	.	200	NE	5	NE	l	C	3 444	6,853	− 344	4 8		
19 & 9	15th M	196	20 12	„	15 10	00	9 80	5 90	5 23	210	233	..	0	V	l	E	..	6,800	+134	1 9	? ?	
	I mbkt.	151	,	„	9 88	− 01	80	5 90	5 .0	228	238	S	3	W	10	A		6,940				
	L. Aq	101	„	„	9 83	− 01	8	5 87	5 43	19.5	..	..	0	W	3	Cl	3 441					
	R. Aq	108	„	„	9 82	+ 02	82	5 88	5 42		205	W	4	SW	12	Cl	3 519	6,960	+ 20	·3		
20 & 10	17th M	197	15 4	'7.5	14 69	+ 10	9 3.5	5 8.5	5 20	215	22.5	V	l	SW	14	S	..	6 287				
	I mbkt.	153	„	„	9 43	+ 15	38	5 83	5 23	265	218	W	9	W	2.5	P	..	6,185	− 102	1 6	Water rose ·15, and high wind	
	L. Aq	103	„	,	9 37	+ 03	37	5 83	5 22	215	.	NW	l	SW	12	B	3 034					
	R. Aq	110	„	„	9 42	+ 05	42	5 78	5 27	..	200	V	l	SW	12	B	3,047	6,081	− 104	1 7		

ABSTRACT TABLE 31

CUBIC DISCHARGE-VERIFICATION

Discharge-Measurements in different Reaches—at same time, or in same water

Belra, Jaoli, and Kamhera Sites.

The Discharges in the four Distributaries are taken from the official Canal Tables (from the daily Gauge Readings). All other Results are actual Experiment, brought forward from Tables L—LV

The F eld-work of lines Nos 32—41 was done in nearly same wo k ng hours at the three S t s.

That of Nos. 43 to 75 was begun earliest at the Upper Site (Belra and latest at the lowest Site (Kamhera) time being allowed for the water to pass from the Upper to the Lower S tes

Simultaneous Discharge Measurements

Comparison No	Date 18??	Upper Site: Belra: Depth: Gauge	Depth: Variation	Wind: From: Direction	From: Velocity	To: Direction	To: Velocity	Cubic Discharge	Distributary Tables: Cubic Discharge Table	Lower Sites: Jaoli: Depth: Gauge	Depth: Variation	Wind: From: Direction	From: Velocity	To: Direction	To: Velocity	Cubic Discharge	Kamhera: Depth: Gauge	Depth: Variation	Wind: From: Direction	From: Velocity	To: Direction	To: Velocity	Cubic Discharge	Total Cubic Discharge	Discrepancy in Discharge: Gain + Loss −: Actual.	Per cent (of max.)	Probable cause of Discrepancy.
32	9 1	7·50	00		0	..	0	5 751	24	7 28	+ 01	V	1	V	1	4 813	5 99	− 02		0	..	0	831	5 687	+ 136	2 3	?
33	10-1	44	− 02	S	0		0	5 739	25	16	00	N	0	NE	7	4 643	98	− 01	V	1	V	1	825	5 725	− 14	2	?
34	17 1	04	+ 03	N	7	NW	3	5 431	296	6 54	− 02	W	11	W	14	4 201	6 01	− 02	N	10	N	18	863	5 362	− 69	1 3	High wind
35	21 1	03	00		0	.	0	5,364	20	76	− 04	..	0	S	4	4 478	5 61	00	..	0	..	0	774	5 461	+ 97	1 8	?
36	22 1	01	+ 02	N	3	NW	4	5 309	22	68	− 02	NW	7	W	17	4 488	61	00	N	13	N	15	794	5 503	+ 194	3 5	High wind.
37	25 1	6 76	00	N	1	..	0	5 311	284	26	00	W	6	W	12	4 024	6 11	00	NNW	9	NNW	10	880	5 188	− 123	2 3	?
38	27 1	70	00	S	1		0	5 142	280	17	− 04	E	6	E	5	3 970	14	00	V	1	..	0	897	5 147	+ 5	1	High wind.
39	28 1	44	+ 04		0		0	4 934	280	5 93	− 04	.	0	SW	6	3 646	12	00		0	V	1	877	4 803	− 131	2 7	?
40	30 1	33	00	.	0	.	0	4 745	265	74	00		0	W	6	3 687	15	00	.	0	NW	9	900	4 860	+ 105	2 2	?
41	31-1	21	00	NNW	7	NW	5	4 718	255	60	00	W	20	W	25	3 416	20	+ 01	NNW	10	N	23	921	4 592	− 126	2 7	High wind

42	5		6 02	00		0		0	4 8	9	5 42	00	SW	11	S V	13	3 940	6 34	02	NNW	12	NW	7	946	4 44	− 135	3 0	H gl wind
43	4		28	00		0		0	4 91	9	62	00	N	3	S	4	3 37	44	02		0	V	l	918	4 577	210	4	l
44	6		41	00		0	N	l	4 80	1	74	00	W	14	W	20	3 84	56	+ 03	NNW	18	NNW	18	98	4 8	− 18	4	H gl w nd
45	7	2	37	− 02		0	N	l	4 91	3	65	00	W	3	N V	10	3 3	51	00	N	13	N	8	967	4 945	− 242	5 1	H gl w nd
46	8		32	00	N	l		0	4 896	247	85	00	S V	10	W	11	3 6	5 80	00	V	l	N	7	842	4 654	− 172	3 6	?
47	10		27	00		0		0	4 24	94	84	01		0	N	3	3 61	55	00	V	l	V	l	68	4 63	32	2 0	?
48	11		5 88	0		0		0	4 41	94	37	06	E	4	SE	4	3 9	55	00		0	V	l	72	4 30	106	2 4	?
49	13	2	82	00		0	N	l	4 481	91	34	04	W	14	W	2	3 33	53	00	N	14	N	14	786	4 236	245	5 5	H gl w nd
50	14		74	00		0		0	4 4	191	39	00	V	l	N	3	3 294	41	00		0		0	46	4 231	− 1	4	?
51	1	2	6 50	+ 04	N	l	N	l	4 718	12	6 31	+ 02	N	6	W	4	3 993	39	00		0		0	777	4 897	+ 109	2 3	?
52	18		53	− 01	N	l		0	4 941	11	33	00	N	4	N	8	4 00	46	00		0		0	61	4 880	61	1 2	?
53	20	2	49	− 01		0		0	4 7 7	1	20	00	NW	16	W	7	3 844	28	00	V	l	V	l	738	4 73	− 40	8	?
54		2	41	00		0		0	4,8 0	174	01	00		0	NW	1	3 7 8	54	00		0		0	80	4 741	− 89	1 8	?
55	24		98	− 05		0	S	l	5 14	0	74	08		0	S	13	4 330	47	00		0	V	l	744	5 074	− 75	1	Water fell 08
56	26	2	79	− 02		0	N	l	5 083	0	60	00		0	N	8	4 13o	45	00		0	V	l	74	4 88	− 203	4 0	?
57			75	− 01	N	l	N	7	4 981	0	57	02	N	6	NW	6	4 199	45	00		0	V	l	748	4 94	− 37	7	?
58	2	2	51	− 05		0		0	4 76	0	23	04	W	10	N V	13	3 9?0	73	− 01	N V	8	NW	9	8 4	4 744	− 18	4	?
59			43	− 03		0	N	l	4 96	0	23	00	W	10	NW	20	3 90o	72	00	NW	11	NW	11	818	4 72	− 73	1 o	H gh w nd
60	8		43	− 02		0	N	l	4 786	0	19	04	NW	10	W	33	3 840	72	00	NW	10	NW	11	818	4 6o8	− 128	2 7	H gh w nd
61	4	3	5 82	00	V	l	N	l	4 761	1o1	5 41	+ 04	S V	6	W	2	3 29	5	00	V	l	NW	1o	797	4 940	− 121	2 8	H gh wind.
62	6		91	00	N	l		0	4 33	198	52	00	NW	11	W	10	3 394	28	00	V	l	V	l	711	4 303	− 27	0	?
63	7		94	− 03		0		0	4 291	147	59	+ 02		0	NNW	5	3 491	33	00		0		0	734	4 37?	+ 88	2 0	?
64	8		92	00		0		0	4 988	147	55	+ 10		0	S V	8	3 306	41	+ 01		0		0	731	4 247	− 41	1 0	?
65	11		75	− 05		0	N	13	4 166	14	21	00	E	11	SE	l	3 909	35	00	N	6	N	13	748	4 09	− 69	1 7	H gh wind
66	13		6 07	+ 26	S	l		0	4 900	171	6 11	+ 32		0	N	11	3 943	36	00		0		0	737	4 8o1	− 49	1 0	Water rose 32
67	1		83	+ 14		0		l	5 10	9	50	+ 20	SW	5	W	3	4 146	30	00	N	3	V	l	796	4 96	− 144	2 8	Water rose 20
68	17		7 29	− 02	N	l	N	l	5 30	62	7 07	− 04	NW	10	W	20	4 493	31	01	NNW	16	NNW	18	73	5 201	− 73	1 4	H gh wind
69	18	3	20	00		0		0	5 394	143	6 86	− 04	W	l	SW	9	4 384	27	02		0	V	l	713	5 246	− 78	1 5	?
70	0		6 86	− 08		0		0	5 174	1o0	29	06	W	8	W	11	3 8	6 21	− 01	N	11	N	11	903	5 042	− 132	2 6	H gh wind
71	21	3	53	− 02		0		0	4 815	140	05	− 06	W	8	W	14	3 701	5 89	00	N	13	N	13	838	4 67J	− 136	2 8	H gh wind
72			51	− 01		0		0	4 781	150	01	+ 02	SW	8	SW	1	3 878	88	00	NW	12	NW	11	86	4 891	+ 110	2 3	H gh w nd
73	24	3	45	− 01		0		0	4 72	51	09	+ 04	W	20	W	2J	3 9 3	69	+ 02	NW	11	NW	10	80	4 774	+ 49	1 0	H gh w nd
74	2	3	00	00		0	S	11	5 19	38	53	+ 02	E	17	E	1	4 209	75	01	E	9	E	9	818	5 06	− 128	2 5	H gh w nd
75	7	J	7 54	− 07		0		0	5 43	2	7 32	− 12		0		0	4 7o4	54	00		0		0	7o	5 536	+ 104	1 9	Water fell 12

Nature of Work		SITES	Serial No	Number of Sets	RANGE OF EXTERNAL CONDITIONS AND OTHER DATA. At ends of Reach: Head Gauge	At ends of Reach: With drawal by Distributaries Q	At ends of Reach: Tail Gauge	At ends of Reach: Obstruction at Tail.	At Experimental Site: Gauge-Reading	At Experimental Site: Depth on Expl Vertl or Hydr Mean	At Experimental Site: Central Depth H	At Experimental Site: Surface Breadth b	At Experimental Site: Wind Velocity.
VERTL. VELY.-CURVES	CENTRAL	Solání Left Aqueduct,	1 4	58	3·6—5·2	Not observed	4·0—3·2	?	9·5— 5·9	9·5—5·9 on Experimental Vertical	9·5— 5·9	85— 82	30—0
		Solání Right Aqueduct,	5- 17	165	3·4—5·3		4·7—2·3	? 4·7—0	10·0— 5·6	10·0—5·6	10·0— 5·6	85— 82	25—0
		Solání Right Aqueduct, [Left Aqueduct closed]	18 20	22	4·5—4·0		2·8	?	4·7— 3·9	4·7—3·9	4·7— 3·9	85	12—0
		Solání Embankment, [Main Site]	21- 28	99	3·2—4·1		4·2—2·5	? 6·7—0	9·8— 4·9	11·0—6·0	11·0— 6·0	170—155	21—0
	NON CENTRAL	Solání Right Aqueduct,	29 40	154	3·8—6·7	Not observed	4·0—3·3	?0—0	9·6— 6·9	9·6—6·9	9·6— 6·9	85— 82	21—0
		Solání Embankment, [Main Site]	41- 46	67	3·3—6·7		4·3—3·3	?0—0	9·7— 7·5	8·9—2·5	10·9— 8·7	169—162	25—0
TRANSVERSE VELOCITY CURVES.	SURFACE	Solání Left Aqueduct,	51- 52	29	3·2—7·9	Not observed	3·9—3·8	?0—0	9·1— 8·8	7·4—7·3 Hydraulic Mean Depth	9·1— 8·8	84	15—0
		Solání Right Aqueduct,	53 59	70	3·4—7·0		4·4—3·3	?—0	10·0— 7·5	7·9—6·5	10·0— 7·5	85— 82	23—0
		Solání Embankment, [Minor Sites]	60	10	3·1—8·0		3·9—3·8	?	9·7— 9·5	?	10·3—10·2	169—168	27—0
	MID	Solání Right Aqueduct	61- 62	17	3·5—8·3	?	4·3—4·1	?0—0	10·1— 9·1	8·0—7·5	10·1— 9·1	84— 82	19—0
	BED	Solání Right Aqueduct,	65 66	7	3·5—7·8	?	4·3—3·7	?0—0	10·0— 8·7	8·0—7·3	10·0— 8·7	84— 82	20—0
	MEAN VELOCITIES	*Solání Left Aqueduct*,	101-107	45	3·4—6·7	266— 0	4·5—3·3	?—0	10·0— 7·4	7·9—6·4	10·0— 7·4	85— 82	20—0
		Solání Right Aqueduct	108 127	174	3·4—1·3	333— 0	4·5—1·4	?3·08—0	10·0— 7	8·0— 7	10·0— 7	85— 82	23—0
		Solání Right Aqueduct, [Left Aqueduct closed]	131 139	12	3·6—1·4	247—50	4·3—2·3	?3·08—0	4·6— 2·6	4·2—2·5	4·6— 2·6	85	12—0
		Solání Embkt. Main site	151-181	153	3·4—1·2	285— 0	4·5— ·9	?2·67—0	10·0— 4	9·3—1·7	11·2— 1·5	171—150	27—0
		Fifteenth Mile,	191-197	17	3·3—6·3	268— 0	4·3—3·2	0	15·3—12·5	9·5—8·4	11·0— 8·2	186—171	14—0
		Belra, ..	201 206	53	3·6—1·8	298— 0	3·6—3·0	·56—0	7·5— 5·7	9·0—7·6	9·9— 8·0	189—187	19—0
		Jaoli, ..	211 217	55	5·6—4·2	100— 0	3·8—2·8	1·00—0	7·3— 5·2	7·8—6·3	8·7— 6·7	193—191	33—0
		Kambera, ..	221 225	56	3·3— ·9	102— 0	3·8—3·1	1·26	6·6— 5·3	4·8—4·1	5·7— 4·4	66— 64	23—0
	Distributaries	Right Jaoli,	231 232	4	?	Not required.	?	?	4·4— 3·1	2·8—2·0	3·8— 2·6	25— 22	0
		Mansurpur,	233 234	5	?		?	?	4·1— 3·6	2·3—2·1	3·6— 3·1	14	*l*—0
		Mitranpur,	235 236	3	?		?	?	3·8— 2·8	1·6—1·2	2·1— 1·4	14	*h*—0
		Pimora,	237 238	4	?		?	?	3·8— 3·3	2·2—1·9	3·4— 2·9	13	*b*—0

RANGE OF RESULTS

Nature of Work		SITES	Serial No	Number of Sets	SURFACE FALL — Sub Reaches: Upper F_1	Middle F_1	Lower F_2	CHIEF VELOCITIES (Each entry is mean of 3 trials): Surface or Central v_o or U_o	Mean U or V	$U - v_o$ or $V - U_o$ c or c	DISCHARGE Supl or Cubic in sq ft or c ft per sec D or D		CENTRAL SURF VELOCITY (Each entry is mean of 4 trials): Expts.	Velocity v_o	Ratio $\frac{V - v_o}{C}$	SURFACE SLOPE: Expts.	Slope S	Ratio $\frac{V - w}{C}$
VERTICALLY CURVES.	CENTRAL	SOLANI SITES	L. Aqueduct, ..	58	5 0—5 6	No Middle Sub-Reach.	5 4—2 5	Surface (v_o)	4 69—3 45	4 20—3 26	96—94	39—19			..	0	?	Slope seldom observed
			R. Aqueduct, .	165	5 6—5 8		5 5—2 5		4 88—3 51	4 73—3 55	1 01—96	47—20		seq previous column of v_o	..	25	300—143	
			R Aqueduct . (L. Aqueduct closed)	22	7—6 3		1 7— 9		7 66—5 31	6 58—5 27	1 00—97	31—21			..	0	?	
			Embankment . (Main Site)	89	5 3—4 5	1 5— 9	5 5— 1 1		4 65—2 67	4 45—2 54	1 00—93	48—15	Superficial (D)	.	..	5	238—193	
	NON CENTRAL		R Aqueduct, .	154	1—5 7	..	5 4— 3 9	Surf (v_o)	4 35—2 05	4 27—2 51	1 13—96	40—18	Surfl (D)	. Not observed.	..	13	?356—190	
			Embankment, (Main Site).	67	2—4 5	1 4—1 1	5 4— 3 6		3 57—2 34	3 54—2 20	97—85	23— 6			..	16	233—200	
TRANSVERSE VELOCITY-CURVES.	SURFACE	SOLANI SITES	L. Aqueduct, ..	29	5 8—5 7	No Middle Sub-Reach.	5 0— 4 8	Central (v_o)	4 48—4 00	4 00—3 71	91	340—315	Supfl (D)	.	..	0	?	Slope seldom observed
			R Aqueduct, ..	70	7 2—5 7		5 5— 3 8		5 13—3 85	4 61—3 60	94—91	399—306		. seq previous column of v_o	..	17	233—178	
			Embankment .. (Minor S teal.	10	5 8—5 7		5 0— 4 9		4 55—3 90	4 21—3 94	96	708—661		..	..	0	?	
	MID	SOLANI SITES	R. Aqueduct, ..	17	6 1—5 7	No Middle Sub-Reach	5 7— 4 7	Central (v_o)	4 88—4 26	4 54—4 10	96—93	378—348	Supfl (D)	. Not observed.	..	1	210	
	BED		R. Aqueduct, ..	7	6 1—5 8		5 6— 4 8		4 55—3 57	4 24—3 42	95—94	361—291		.. Not observed	..	0	?	
	See upper half of Table.	SOLANI SITES	L. Aqueduct, ..	45	6 0—5 6	No Middle Sub-Reach.	5 6— 3 9	Central (v_o)	4 44—3 33	4 12—3 34	98—94	5,441—2,131	(D)	1 4 05	85	16	235—183	1 06— 89
			R Aqueduct, ..	174	7 8—4 3		5 7— 1		4 69— 57	4 35— 60	1 05—90	3 651— 36		56 4 78—1 83	90—84	78	330—113	1 19— 66
			R. Aqueduct .. (L. Aqueduct closed).	12	5 5—3 6		1 0— 0		5 17— 71	4 87— 69	97—87	1,048— 212		10 5 79—1 42	89—79	10	480—024	1 30—1 05
			Embkt., Main site	153	7 6—3 4	2 1— 1	6 0— 0		4 55— 41	4 11— 44	1 10—89	7,364— 114		71 4 70— 83	1 01—80	92	323—038	1 07— 35
			Fifteenth Mile, ..	17	*5 3—2 1*	*3 8—3 6*	*5 5— 3 7*		*4 55—3 66*	*4 16—3 51*	96—91	7,187—4,370		17 4 91—4 21	91—80	16	203-?215	? 96— 83
		LOWER SITES	Belra, ...	53	1 2— 4	No Middle Sub-Reach.	4 1— 2 4	Central (v_o)	3 47—2 67	3 27—2 79	99—97	,760—4 064	Subl (D)	47 3 78—3 26	93—89	50	255—168	81— 66
			Jaoli, ...	55	6— 2		5 6— 3 5		3 37—2 65	3 06—2 57	97—93	4,813—3,202		53 3 55—3 02	92—80	51	183—129	·93— 78
			Rambera .	56	3 1—2 6		11 9—10 2		3 33—2 52	2 95—2 63	98—93	982— 711		50 3 54—2 90	94—81	50	318—267	·82— 74
		DISTRICT TARIES.	R Jaoli, ..	4	No Observations				2 73—2 24	2 52—2 10	94—91	191— 98		2 2 95—2 51	85—84	..	Slope not observed	..
			Mansárpur, .	5					2 48—2 26	2 14—2 03	*·90—·69*	*91— 73*		*3 2 49—2 43*	86— 84	..		..
			Mírapur, ..	3					1·67—1 58	1 59—1 49	95—94	41— 25		1 1 79	83	..		..
			Lamora, ..	4					2 13—1 92	1 84—1 71	88—87	63— 48		2 2 26—2 09	86—81	..		..

ABSTRACT TABLE 33.

SPECIMEN FIELD BOOK.

Details for Series 201, *line* 2, (9-1-'79)

NATURE OF WORK, *MEAN VELOCITIES* DATE, *9 1-'79*

Place, *Belra Site*
Run, *50 feet* Watersurface, *188·49 feet*
Vertical of Experiment, (*see "Explanation"*) Instrument, 1" *tin Rods.*
Gauge Reading, (1), *7 50* (2), *7 50* (3) .. .. (4) ..
Wind (1), *None.* (2), *None* (3) .. .. (4) ..
Commenced, *1 10 p m* Ended, *4 p m.*

Abscissa.	No	FIRST SET, Times U	Times L.	D	M D v	SECOND SET Times U.	Times L	D	M D. v	Remarks [Rods used]
m, L	1	9	55	46	48 50					2
	2	2 5	56	53 5	2 06					
	3	15	61	46						
90, L	1	9	50	41	40 33					2'
	2	3	41	38	2 48					
	3	12	54	42						
80, L	1	9	40	31	31 00					2
	2	3	34	31	3 23					
	3	18	49	31						
70, L	1	7 5	36	28 5	29 50					2¼
	2	15	47	32	3 39					
	3	3	31	28						
60, L	1	7	37	30	30 67					2¼
	2	14	44	30	3 26					
	3	9	41	32						
40, L	1	7	38	31	30 00					2¼'
	2	4	34	30	3 33					
	3	9	38	29						
20, L	1	1	31	30	30 50					2
	2	5	37	32	3 28					
	3	14 5	44	29 5						
Centre	1	9	41	32	31 33					2¼
	2	22	54	32	3 19					
	3	6	36	30						
20, R	1	9	39	30	27 83					2¼
	2	1 5	29	27 5	3 59					
	3	7	33	26						
40, R	1	3	34	31	31 00					2'
	2	12	42	30	3 23					
	3	5	37	32						
60, R	1	1	30	29	28 67					2'
	2	8	35	27	3 49					
	3	5	35	30						
70, R	1	3	36	33	30 00					2
	2	6	33	27	3 33					
	3	6	36	30						
80, R	1	4	37	33	33 00					2¼
	2	3	36	33	3 03					
	3	10	43	33						
90, R	1	1	44	43	40 33					2'
	2	6	45	39	2 48					
	3	17	56	39						
m, R	1	1	65	64	53 00					2¼'
	2	8	57	49	1 89					
	3	12	58	46						

If a second SET of similar Field work were done on same day the entries would be made here

The Gauge-Readings and Winds at beginning and end of second Set would be entered as Nos (3) (4) in the Heading

Explanation.—This Form served for velocity work past either a vertical or transversal The present specimen (Mean Velocity work) is of latter sort

Heading {(In the former case the "position of the Vertical of Experiment would have been filled up in the Heading, and the word "Depth" substituted for Abscissa at head of left Column.)
{The portion of the Heading in italics was filled in the Field The rest of the Heading was ready printed}
{The Gauge-Readings and Wind "ntries Nos 1 2 are those noted at beginning and end of the First Set of velocity work

Columns. {The Column "Abscissa shows the distance (± y) of each Float Course to right or left (R L) of centre
{The Columns U L contain the number of chronometer beats counted at passage of each Float under the Upper and Lower Ropes respectively
{Column D contains the difference between the numbers in Cols U L, i.e. the time (in half seconds) of passage of each Float through the 50 Run
{Col M D and v contains two entries whereof the upper (M D) is the mean differences (mean of each trio of differences in Col. D), i.e., the mean time of passage through the 50 Run and the lower (v) is the velocity corresponding (which may be taken by inspection from a Table of Reciprocals)
{The velocities (v) were filled in office The rest of the entries were made in the field.

SPECIMEN OF COMPUTATION OF CUBIC DISCHARGE

BELRA SITE

These are the details of computation of the Discharge-Result (**D**) shown in l ne 2 of Series 201, 9 1 '79

Date, 1879	Gauge-Reading	Surface-Breadth	Description of Line.	STEP I COMPUTATION OF DISCHARGES (D = Hu) PAST EACH VERTICAL															
				Simson s		Cubic	Weddle s					Cubic	Simson s						
				Left of Centre								Right of Centre							
	ft	ft		Edge	m	90	80	70	60	40	20	Centre	20	40	60	70	80	90	m	Edge.
8 1	7 52	188 51	Soundings[1],	..	..	6 41	9 51	9 83	9 78	9 50	10 13	9 65	10 13	10 28	10 48	10 36	9 71	6 01	..	..
9 1	7 50	188 49	Depths[2], H =	0	4 25	6 39	9 49	9 81	9 76	9 48	10 11	9 63	10 11	10 26	10 46	10 34	9 69	5 99	4 25	0
			Rod velocities[3], u =	?o	2 06	2 48	3 23	3 39	3 26	3 33	3 28	3 19	3 59	3 23	3 49	3 33	3 03	2 48	1 89	?o
			Discharges[4], Hu past each vertical,	0	..	15 85	..	..	31 82	..	33 16	30 72	36 20	..	36 51	..	..	14 86	..	0
				..	8 76	..	30 65	33 26	..	31 57	..	30 72	..	33 14	..	34 43	29 36	..	8 03	..

	Simson s	Cubic	Weddle s	Cubic	Simson s
STEP II. COMPUTATION OF CUBIC DISCHARGE.	4 × 8 76 = 35·04 15 85 6)50 89 8 48 4 25	3 × 63 91 = 191 73 47 67 239 40 $\frac{2}{3}$ × 10 = $\frac{20}{3}$ 30 8)7182 00	5 × 90 43 = 477 15 168 50 645 65 $\frac{3}{10}$ × 20 = 6	3 × 63 79 = 191 37 51 37 242 74 $\frac{3}{8}$ × 10 = $\frac{15}{8}$ 30 8)7282 20	4 × 8 03 = 32 12 14 86 6)46 98 7 83 4 25
Total Cubic Discharge D = 5751·25 = Sum of	.. .. .. 36 04	.. .. 897 75	.. .. .. 3873 00	.. .. .. 910 28	.. .. .. 33 28

[1] The Soundings are deduced from Detailed Table II [2] The depths (H) are obtained by subtracting the fall (·02) of water-level from the Soundings except at the m-Pendants the depth at which is—(since the side-slopes are 1 in 1)—accurately given as $\frac{1}{2}$ × difference of surface-breadth 188·49 and bed width (180') [3] The Rod velocities (u) are taken direct from the Field Book (Table 33). [4] The products Hu are ranged in two lines so as to admit of rapid addition of the ordinates (horizontally by inspection) as required in the several formulæ (Weddle s, Cubic, Simson s).

END OF TABLES